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Massachusetts Medical Society.

MEETING OF THE SECTION OF SURGERY, JUNE 8, 1915.

I.

LOCALIZING NEEDLE FRAGMENTS IN THE TISSUES OF THE BODY BY MEANS OF MAGNETISM. DEMONSTRATION.*

BY GEORGE H. MONKS, M.D., BOSTON.

DR. MONKS called attention to the fact that in certain cases in which needles, or needle fragments, are buried in the tissues of the body, the use of magnetism may help the surgeon in localizing the foreign body. In order to use the magnetic test it is necessary first to magnetize the buried needle, and then, by means of a delicate magnetized indicator of some kind, to localize it.

To magnetize a buried needle an ordinary steel magnet usually suffices, and for an indicator a fine magnetized needle suspended at, or near, its middle by a fine silk thread or even by a human hair. A very small compass may also be used.

The magnetic test is apparently only applicable in those cases where the buried fragment is large, and near the skin.

The technic of the method was then demonstrated, and a box containing a number of needle-fragments which had been localized by magnetism, and removed from patients, was passed about for inspection. Accompanying this box were fine magnetized needles attached to delicate silk threads, for use in applying the magnetic test to the needle fragments in the box.

* See BOSTON MED. AND SURG. JOUR., February 25, 1915, Vol. clxxii, p. 285.

DISCUSSION.

DR. W. M. BOOTHBY, Boston: The apparatus devised by Dr. Monks is excellent for locating small elongated bodies, like needles, lying only a short distance below the skin.

It may be of interest to bring to your attention an apparatus recently devised by Prof. Bergonie of Bordeaux for locating fragments of shrapnel imbedded in the deeper tissues. While we were at the American Ambulance Hospital, Paris, Prof. Bergonie demonstrated the apparatus to the Harvard Unit. The apparatus consisted of an electric magnet of considerable power and a motor for rapidly reversing the direction of the electric current. When the electricity flowed in one direction the magnet would attract: when flowing in the opposite direction it would repel the steel or iron fragment. The rapid reversal of the magnetic force set the foreign body into vibration and the palpating finger of the surgeon could locate the body as being directly beneath the point of maximum vibration. By using a sterilized point the exact location could be reascertained after the incision was made and the surgeon was working in the approximate region of the shrapnel fragment.

II.

ACUTE PERFORATION OF ULCERS OF THE STOMACH AND DUODENUM.*

BY IRVING J. WALKER, M.D., BOSTON.

THE stomach and duodenum are today receiving more attention from a surgical standpoint than any other of the viscera. We have now so perfected the diagnosis and the surgical technic of the operation for chronic ulcer of these organs that the mortality from operation is comparatively low. For the time being, in this enthusiasm, we have overlooked the disaster that may result from harboring a chronic ulcer, namely, acute perforation of the stomach and duodenum. There is no condition in which the picture of apparent health is so suddenly changed to one of gravity, so eminently fatal if not recognized early, and so amenable to treatment if operated on without loss of time.

The cases upon which this paper is based were gathered from the surgical records of the Boston City Hospital for the years 1905 to 1914, inclusive. Interest in the subject was aroused by the somewhat high mortality generally attributed to this lesion, in the hope that some reason might be found accounting for this. The series covers 78 cases, operated upon by 17 surgeons. With so large a number of operators, one would expect to find a greater or less variation in operative procedures and end results. However, this was not the case. The technic was, in general, similar, and the operative results practically the same. Nevertheless, a few conclusions have been derived from the review.

Etiology. As to the cause of perforation of the stomach and duodenum, no new light has been cast by this study of 78 cases. Males were found to have been affected more frequently than females, in the proportion of 12 to 1. The average age of the males was 35, and of the females, 29. Sixty-six and two-thirds per cent. gave a definite alcoholic history. Probably few of the others were abstainers, judging from the trend of cases admitted to such an institution. While alcohol, perhaps, played no part in causing the perforation, we certainly can indirectly attribute to it a considerable percentage of the mortality, as of those who succumbed 78% used alcohol in more than moderation. This factor and the lack of nutrition in many of the individuals undoubtedly makes the mortality higher in such cases in the large hospitals than we find in private practice; and for this reason one should not compare the statistics of the two.

The site of the perforation was found to have been in the stomach in 42 cases, and in the duodenum in 36 cases. The perforations of the stomach were invariably located within one and one-half inches of the pylorus. In all except two, the site was on the anterior wall, and generally nearer the lesser curvature. The perforations of the duodenum were all found upon the anterior wall except one. Although Eliot[1] collected eighteen cases in which there had been multiplicity of perforations, none were found in this review. Nevertheless, one should be on constant guard lest a second perforation be overlooked,—as were most of those described by Eliot, being discovered only at subsequent autopsy. Especially is this true of the perforations on the posterior wall of the stomach, which can be easily overlooked unless gas, stomach contents, or exudate appears in the lesser peritoneal cavity.

Diagnosis. In the diagnosis certain symptoms and signs stood out above all others found in the condition, and should be more fully explained. As one might expect, nearly every case gave a previous history of a lesion of the stomach or duodenum which had lasted from a few weeks to several years. The symptom of perforation that was most prominent was the character and location of the pain. This was invariably described as sudden, severe, and sharp, localized generally in the epigastrium, radiating at times into the right lower quadrant. In not a few cases, this sudden onset had been preceded for several days by more or less indefinite pain located in the region of the epigastrium, terminating in the sudden, severe type described above. Many times vomiting immediately followed this severe attack of pain, but was not persistent unless peritonitis was present. Occasionally it was observed as being prolonged before peritonitis had developed in cases of duodenal perforation. This has been described as due to the fact that in perforation of the stomach, with even slight expulsive effort, gastric contents escape more easily through the perforation into the peritoneal cavity than upwards through the esophagus; while in perforation of the duodenum, the stomach is intact and the mechanism of vomiting therefore undisturbed. The classical symptoms of peritonitis seen in most of the fatal cases need not be described.

Shock has been cited as a most important symptom of perforation. In reviewing this series, however, the writer was impressed by its absence in the majority of cases. Examination of the records shows that shock when present is more frequent in perforation of the stomach than of the duodenum. We have no explanation for this observation. Certainly, the amount of shock seen in perforation cannot approach in severity that found in acute pancreatitis or mesenteric thrombosis. Absence of liver dulness, so often spoken of as a sign of perforation, was recorded only five times. Whether this sign was not present or was not discovered cannot absolutely be determined. Suffice it to say, the impression that it made upon the minds of those examining the cases was not great enough to incorporate its presence or absence in the records. Therefore, we are led to believe that the value of this sign in the diagnosis has been exaggerated. Shifting dulness in the flanks, showing

* Read before the Section of Surgery of The Massachusetts Medical Society, June 8, 1915.

fluid, was found in 18 cases. In a board-like abdomen, its presence can be of value in making the diagnosis of perforation only when taken in conjunction with the other symptoms and signs.

Differential Diagnosis. The most common condition with which perforation of the stomach and duodenum has been confused is acute appendicitis. This mistaken diagnosis occurred seven times in this series. The reason is easy to see. In acute perforation, pain may be referred to the region of the right lower quadrant of the abdomen because of the fact that the contents of the stomach or duodenum have gravitated in that direction, producing peritoneal irritation in that region. However, in acute perforation, tenderness and spasm are most marked in the epigastrium, and in acute appendicitis in the right lower quadrant. As peritonitis progresses, the difficulty of differentiating these conditions increases, and often the diagnosis cannot be made until operation.

Acute disease of the gall-bladder or pancreas may simulate perforation. The close relationship between the duodenum and the gall-bladder makes it evident how lesions of the one may resemble those of the other. In both, the tenderness and spasm is most marked in the epigastrium, but in perforation it is more apt to be localized nearer the median line. Fluid, if present, is much less in amount in acute disease of the gall-bladder than in perforation. From the location behind the stomach and duodenum, one can easily perceive how acute disease of the pancreas can resemble perforation. However, the degree of shock in acute pancreatitis is more severe than is generally seen in perforation; but here again, as in acute appendicitis, the diagnosis can frequently be made only when the peritoneal cavity is opened. Happily for the surgeon, perforation, acute pancreatitis, and acute disease of the gall-bladder, can usually be treated through a similar incision: one to the right of the median line between the lower border of the ribs and umbilicus. As to differentiating between perforation of the stomach and perforation of the duodenum, while an interesting point in diagnosis, is perhaps not absolutely necessary as it would not influence surgical treatment in case of operation.

Treatment. The treatment of acute perforation of the stomach and duodenum is unquestionably surgical once the diagnosis has been made and the patient in condition to stand operation. Observation, in such cases, results only in a higher mortality. One procedure that all surgeons agree upon is the necessity of closure of the perforation by some means. Suture is the ideal way of closing the orifice. However, instances arise when this is impossible because of the inaccessibility of the opening, or the friability of the tissues to be sutured. Bessel-Hagen[2] and Downes[3] have utilized the gall-bladder as a means of closing the perforation. Others have used flaps of omentum to suture the orifice. Still others, as a last resort, have simply tamponed the openings with gauze. Cases treated in this way may recover, but usually present a fistula, which may or may not close spontaneously. The question of how much more one should do in the way of operative measures is not yet settled. Theoretically, we should all like to excise or enfold the ulcer-bearing area and do a gastroenterostomy in every case. Practically, however, this is not always feasible, owing to the condition of the patient or to the danger of spreading the already existing infection. Gastroenterostomy becomes a necessity in any case where the pylorus is greatly narrowed because of suture of the perforation. It becomes a matter of choice in the small group of cases seen soon after perforation, where the infection is local and the patient is in good condition. In this group, most writers agree that the procedure is safe and well worth while as a curative measure for the existing ulcer. However, it is not a necessity, as it is well known that the vast majority of perforated ulcers heal with suture alone without gastroenterostomy. In this series, gastroenterostomy followed suture of the perforation in three cases, with recovery in each instance. Given a patient of good operative risk seen immediately after perforation, one would not hesitate to enfold the ulcer and do a gastroenterostomy. However, the average operator will have a lower mortality in a large series of cases by simply suturing the perforation and later, if judgment warrants, doing a gastroenterostomy with comparative safety.

The question of irrigation of the peritoneal cavity was interesting to the writer. In this series, the cavity was generally irrigated in 20 cases, with 9 deaths and 11 recoveries. All the cases irrigated showed a peritonitis more or less marked. Therefore, one should consider a similar variety of cases not irrigated. Of those cases showing peritonitis, which were not irrigated, there were 9, with 5 deaths. The figures here given tend to show that general irrigation of the peritoneal cavity was beneficial in cases of diffuse peritonitis. In the others, it is probably far better to do the cleansing with wet sponges.

It has been said that drainage is not necessary in those cases seen soon after perforation, since the contents of the stomach and duodenum are usually sterile and what infection there is will be cared for by the peritoneum. In 29 cases in this series, cultures were taken from the fluid in the peritoneal cavity. Of these, 14 showed bacterial growth, and 15 were negative. There can be no way of determining macroscopically in a given case whether the fluid present is sterile or not, and if not sterile what may be the number and virulence of the organisms. It was undoubtedly good judgment that led the operators in this series to drain in all except two cases. However, there are cases seen immediately after perforation, where the escaped contents, if not large in amount, can be sponged out and the abdomen closed without drainage. In most cases

where fluid was found in the pelvis, that part of the abdomen was drained through a stab wound. The drains were all dispensed with in from two to four days, unless secondary abscesses developed.

Complications. The most common complication found was peritonitis. This was given as the cause of death in 14 of the 21 cases.

Occasionally it resulted in a localized abscess in the pelvis, right lower quadrant, or subphrenic region.

Post-operative hemorrhage and shock were given as the cause of death in three instances. Pneumonia occurred six times, with four deaths.

The other complications recorded were pleurisy with effusion, and abscess of the lung, with recovery in each case.

Results. In the above series of cases, there were 57 recoveries and 21 deaths, a mortality of 26.9%. This is considerably lower than the mortality usually attributed to this condition. As we have stated above, the individuals were, for the most part, poor operative risks. Add to this the fact that the average duration of the perforation was 25.9 hours. Of those who recovered, the average duration of the perforation was 14.5 hours, and of those who died 37.3 hours. Seventeen were operated upon during the first four hours, and all recovered. Of those operated upon from 5 to 12 hours after perforation, the mortality was 17.9%; of those operated on from 13 to 24 hours, 47.6%; and of those from 25 to 48 hours, 66.2%. Ten were operated upon after 48 hours, with 5 deaths and 5 recoveries. Of those who recovered, it should be said that each had a walled-off abscess, and not a generalized peritonitis, thus accounting for the recoveries.

It would appear from the analysis of these cases, as well as from those of other writers, that a high mortality can generally be attributed, not to the technic of operation, but rather to the unpardonable mistake of allowing such cases to wait hours before surgical advice is sought. A certain number of patients are themselves responsible for the error of not having sought in time medical advice for chronic ulcer of the stomach and duodenum, and later for the symptoms of acute perforation. However, a goodly number of others are themselves blameless, having been rather indifferently treated for indigestion, stomach trouble, or even ulcer, without having the importance of following up the treatment and the danger of the existing lesion impressed upon them.

CONCLUSIONS.

1. The history of disturbance of the stomach or duodenum should always be sought for in cases of suspected perforation.
2. Sudden, severe epigastric pain is the most constant symptom in the diagnosis of this condition.
3. Shock is an inconstant symptom.
4. The value of the absence of liver dulness as a sign of perforation of the stomach or duodenum has probably been overestimated.
5. Simple closure of the perforation, with drainage of the peritoneal cavity is the safest procedure in the majority of cases.
6. The mortality can be diminished by greater care in the diagnosis and in the treatment of chronic lesions referable to the stomach and duodenum, so that but few are allowed to reach the stage of perforation, and even those, given the benefit of surgical measures while the chances of recovery from operation are still good.

REFERENCES.

[1] Eliot: American Journal of Surgery, December, 1908 to January, 1909.
[2] Bessel-Hagen: Deutsch. med. Woch., 1907, xxxiii, 1657.
[3] Downes: Annals of Surgery, 1910, Vol. 2, p. 173.

III.

CONCERNING TRAUMATIC RUPTURE OF THE DUODENUM AND DUODENAL FISTULA. WITH THE REPORT OF A CASE.*

BY DAVID CHEEVER, M.D., BOSTON.

[From the Peter Bent Brigham Hospital, Boston.]

THE comparative rarity of rupture of the duodenum, due to injury, and more particularly of cases of recovery from this condition, justify the reporting of a single case and a discussion of the principles involved in its treatment, which are not confined in their application to this particular trouble.

The patient, R. J. S., a schoolboy fifteen years of age, on January 6, 1914, tried to cross the street in front of a slowly moving automobile, but slipped on the ice and fell down in front of it. Witnesses stated that one front wheel ran over his body. The accident occurred at 1.30 p.m. He was able to extricate himself from under the car, and walk to the sidewalk, whence he was taken home, and his physician called, who found him in a condition of shock and suffering a good deal of abdominal pain. He was brought to the Peter Bent Brigham Hospital, about one and a half hours after the injury.

Examination showed a well developed boy in a condition of slight shock: pulse 50, blood pressure 110, respiration somewhat rapid, temperature normal. Except for a slight abrasion on the left thigh, there was no external sign of injury. The abdomen was slightly tender and spastic generally, but there were no localizing signs, and, with the exception of slight dulness in either flank, which did not change on change of position, was practically negative. At this time the points of maximum tenderness were on either side about the level of the umbilicus. The objective signs did not seem to justify intervention at this time, especially as the testimony of witnesses differed as to whether or not the boy had actually been run over or simply thrown to the ground and stunned. When seen again, about three hours later, he looked more sick, had begun to complain of abdominal pain, and showed fairly well-marked

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tenderness in the right iliac region,—scarcely any tenderness in the epigastric region. During examination at this time the patient vomited a small amount for the first time. Pulse was 84. Diagnosis of probable rupture of a viscus was made. An operation was advised, and later accepted.

About eight hours after the original injury, under ether anesthesia, the abdomen was opened in the middle line below the umbilicus, since the evidence seemed to point more to an injury in the lower abdomen than elsewhere, and in the writer's experience the lower part of the ileum had been the most frequent seat of traumatic rupture. Free gas and a large amount of bloody, brownish fluid was found, and sponged out of the pelvis and either iliac fossa. The small intestine was now examined from the ileo-cecal valve without finding any injury. It was not until a sponge was thrust upward toward the region of the gall-bladder that the first correct clew as to the seat of the lesion was found in the appearance of a green staining, evidently due to bile. Another incision was at once made through the right rectus from the costal border downward, and, after considerable difficulty, due to the infiltration of all omental tissues by the extravasating fluid, a laceration admitting a thumb was found on the posterior aspect of the first part of the duodenum about 3 cm. distal to the pylorus. It was circumferential to the long axis of the gut, and its edges were pouting as though it had been caused by a bursting force. Its situation was such that it was in part extra- and in part intra-peritoneal, which made closure difficult, but a fairly good repair was made with chromic cat-gut. The abdomen, all of which showed traces of extravasated fluid, was thoroughly washed out with salt solution, and drains carried down to the injured duodenum and to the bottom of the pelvis. The patient left the table in rather poor condition.

The immediate after-treatment consisted of the Fowler position, proctoclysis, and appropriate stimulation. For the first three days, he showed marked toxemia and seemed to be going down hill, but then began to improve. On the fifth day after the operation, a suspicious discharge appeared in the upper wound, together with evidence of tissue digestion and skin irritation. Soon after, a profuse, bile-stained, extremely irritating discharge became established, which caused the wound to re-open throughout its length, undermining the skin and rapidly digesting the skin edges and the tissues of the abdominal wall. Whatever food was ingested appeared in a few minutes afterward in the discharge, and it seemed unlikely that any material portion passed onward. The boy's general condition was now very poor, showing more prostration and exhaustion than would be expected merely from the lack of nutrition and the amount of obvious infection, since there was no evidence of a general peritonitis. It was evident that, unless the discharge could be stopped, a fatal issue must come. Accordingly, a small rubber tube was carried down to the bottom of the wound, and held in place by appropriate means, and a continuous irrigation of the sinus with sterile water inaugurated,—the overflow being conducted into receptacles by means of a bank of rubber tissue, which was made to adhere to the skin about the wound by means of chloroform. By this means the digestive juices were kept highly diluted, and immediate cessation of the destructive process was noted, together with an improvement in the patient's general condition. This continuous irrigation was continued for five days and nights, requiring the presence of an attendant constantly by the bedside. On the fifth day, it was omitted in part, because the secretion had markedly diminished, and no more food was appearing, and on the sixth day it was discontinued, and from that time there appeared no more leakage from the fistula, and the wound began to heal satisfactorily. No more trouble was experienced from this source, but the rest of the convalescence was stormy, requiring three subsequent laparotomies in the course of the next month for the drainage of large residual abscesses in the lesser peritoneal cavity, in the right iliac fossa, and in the pelvis, respectively.

He was finally discharged fifty-eight days after his admission, and has since made a complete convalescence, and presents no symptoms referable to this illness.

Ruptures of the intestines by trauma are relatively common lesions, and of these the duodenum, by virtue of its fixed position against the spine, yields its share. Berry and Giuseppi's[1] analysis of 132 lacerations of the intestinal tract gives the following figures:—

Large intestine	10
Duodenum	23
Duodeno-jejunal flexure	3
Jejunum	32
Ileum	32
"Small intestine" (not further specified)	25
Large and small intestine together	4
Incomplete rupture	3

Hertle's[2] figures in 122 cases are not essentially different:—

Large intestine	10
"Small intestine" (not further specified)	31
Jejunum	29
Ileum	40
Duodenum	12

Combining these figures the conclusion is reached that 13.7% of all intestinal ruptures (excluding lacerations due to instrumental perforation of the abdominal wall) involve the duodenum, or nearly twice as many as involve the large intestine (7.8%).

Traumatic rupture, wherever localized in the intestinal tract, is notoriously fatal. Combining the figures of three large series of cases, those of Berry and Giuseppi, Hertle and Travaststjerna,[3] we find a general mortality of over 80%. Yet even more striking are the figures for rupture of the duodenum, 92.6%; or, including 4 cases reported in the last year, 93.1%. Several obvious factors contribute to this mortality,—the largely retroperitoneal situation of the duodenum permits the rupture and extravasation to be extra-peritoneal where its evidence is masked until too late, or where it is actually overlooked during exploratory laparotomy. Thus Meerwein,[4] writing in 1907, states that of 28 cases of extra-peritoneal rupture operated on, in six the lesion was not found until autopsy. The rapid and extensive diffusion of the infiltration is favored by the loose areolar tissues of the pos-

terior abdominal wall, so that huge phlegmons are frequent The deep-seated and inaccessible tear presents technical difficulties in operative closure. Finally, the noxious character of the contents of the duodenum, whether merely intensely irritating and digestive in their action, or possessed of a specific toxic action, must be reckoned with.

In an interesting paper, Kanavel[5] reports two cases of traumatic rupture of the duodenum, following the kick of a horse and a blow by a wagon pole, respectively, operated on 52 hours and 34 hours after the injury and presenting a rupture of the retro-peritoneal portion of the duodenum in each instance, and in addition, in the first case, a laceration of the root of the mesentery, which allowed the extravasation to enter the abdominal cavity. Both patients died,—one 6 hours and the other 50 hours after the operation; in both instances it seemed that death was more speedy and apparently the result of a much graver toxemia than would be expected from the degree of peritonitis, or of local injury, existing.

Reasoning from his observation of this peculiar toxemia, and from the well-known fatal course of high intestinal obstruction, both experimental and clinical, in which the secretions of the duodenum undoubtedly play an important rôle, Kanavel ascribes a specific toxicity to the extravasated material. In most of the recorded cases no especial stress is laid by writers upon this point. Sometimes, indeed, the fatal progress of the disease is comparatively slow, as in Maddock's[6] patient, who was seen six weeks after a severe blow in the right abdomen, when an extensive subphrenic and retroperitoneal phlegmon was incised, followed by death in seven days. Autopsy showed a rupture of the second part of the duodenum. In comparatively few instances has fat necrosis been reported. On the whole, while a specific toxicity may well be suspected, it cannot yet with certainty be ascribed to the duodenal contents, in the absence of changes wrought by stasis and circulatory strangulation incident to obstruction of the gut. Kanavel reviews briefly the literature of this subject to date, including 94 cases which show a mortality with or without operation of 92.6%. Since his paper, a brief review of the literature discloses four additional cases, all operated on and all fatal.

The mechanism of traumatic rupture of the intestinal tract in general is usually described under three heads: a rupture due to (1) a crushing force, (2) a bursting force, and (3) a tear due to sudden traction. In the first group, the intestine must be compressed between the impacting force and a part of the skeleton, as the spinal column or the pelvis. Evidently the third portion of the duodenum, fixed across the lumbar spine, is ideally situated for this lesion, and it is in fact the part of the duodenum most frequently injured. Keller[7] considers that the bursting rupture is very rare, since it is supposed to require that the loop be full of liquid whose means of egress is obstructed, and since the duodenum is rarely full he believes that its traumatisms are not of this character. To the writer, however, it seems probable that the present case belongs to this class, since the automobile wheel mounting upon the abdomen from the right side would naturally drive the gaseous and liquid contents of the second part of the duodenum against the closed pylorus, thus effectually producing a bursting pressure. Moreover, it is difficult to conceive how the first part of the duodenum, retreating from the convexity of the lumbar spine, could be subjected to a direct crushing force sufficient to produce rupture.

The symptomatology of this condition needs no extended comment. Local pain, muscle spasm, tenderness, increasing pulse rate, later vomiting, perhaps shifting dulness in the flanks, leucocytosis, unless the toxemia be overwhelming, constitute the familiar picture of a severe abdominal lesion. A word of warning may be uttered, however. If the rupture be retroperitoneal, the condition may at first be masked, but soon a tender tumor, not shifting, in the right hypochondrium and umbilical region, with evidence of physical shock will give the clue. If intra-peritoneal, the effusion may cause pain not so marked at the point of rupture as in the more dependent portions of the abdomen,—the iliac fossae or the pelvis, due apparently to the intense irritation of the peritoneum by the gravitated contents. In the present case this was the cause of an ill-placed primary incision and loss of time. Absence of liver dulness, a sign handed down from text-book to text-book as pathognomonic of rupture of a hollow viscus, is in reality a hollow mockery. Rarely demonstrable in the early and curable stages of a perforative peritonitis, when found it gives assurance of the correctness of the diagnosis and of the hopelessness of intervention.

When the abdomen has been opened and the lesion identified, what course shall be pursued? Repair of the rupture by suture, resection of the bruised bowel with gastro-jejunostomy and duodeno-jejunostomy, closure of the proximal limb and gastro-jejunostomy, leaving the duodenal contents to find their way through the pylorus and thus into the intestine, have all been successfully practised. It is no time, however, for elaborate procedures. The evidence is overwhelmingly in favor of promptness, simplicity and speed. A simple repair of the laceration by suture, washing out the extravasated material, and the institution of proper drainage are the indications, reserving resections and anastomoses for the rare cases where local repair is impossible. If the patient survives the immediate effects of trauma, the operation for repair of the lacerated bowel, the threat of peritonitis and of a primary retro-peritoneal cellulitis, a complication of gravest portent may be introduced by the failure of the repair and the establishment

of a duodenal fistula. Such a fistula never heals unaided, and if not healed is invariably fatal. Pannett,[8] writing in 1914, reports a case of recovery from a duodenal fistula, and says but three other cases are to be found in the literature of the previous ten years, and indeed one of these, that of Berg, should scarcely be included, since, although a duodenal fistula following a cholecystenterostomy ceased discharging, the patient died 17 days after operation! W. J. Mayo,[9] writing in 1914, reports 3 cases due to injury to the duodenum by a clamp placed on the kidney pedicle during a right nephrectomy, all fatal. Subsequently,[10] in 1915, he reports an additional case where he exposed the laceration by transperitoneal mobilization of the duodenum and repaired it, with recovery. Probably further reports will show many recoveries from duodenal fistula, but of its gravity there can be no question. The methods of combating these fistulae are of vital interest to the surgeon confronted by one. The secretion evidently is composed of the gastric juice with whatever food has been taken, the bile, pancreatic juice and succus entericus, or secretion of the duodenum itself. Of these substances, by far the most important is the pancreatic juice with its tissue-digesting enzymes and its alleged specific toxicity incidental to auto-digestion or its own absorption into the blood stream. Another invariable feature of these fistulae is the loss of practically all nutriment taken into the stomach, with consequent rapid failure of nutrition and vital resistance. Efforts then should be directed toward neutralizing or removing the pancreatic juice and increasing the nutrition by rectal feeding, or even by jejunostomy. There is no agent which wholly stops the secretion of the pancreas. So far as is known, it is increased by the presence of food in the stomach, which inaugurates nervous impulses through the splanchnic nerves, causing a secretion rich in the pancreatic ferments, but poor in the alkaline elements. This action may be in part inhibited by atropin. In addition it is believed that the acid gastric juice acting on the duodenal mucous membrane forms a hormone (secretin) which, having been absorbed by the blood, is carried to the pancreatic cells and there stimulates a secretion which is said to be rich in the alkalies and poor in ferments. Reasoning from these premises, it would seem proper to withhold all food from the stomach, or give only that which, like milk, does not excite gastric secretion, to give an alkali to further insure against gastric acidity, and to keep the patient under the influence of atropin. The chief dependence should undoubtedly be placed, however, on the dilution or mechanical removal of the secretion as fast as it appears, either by constant irrigation, as employed in the case reported today, or by some appropriate suction apparatus, as employed recently by Jones[11] and Williams,[12] or even, perhaps, by immersion of the patient in the constant bath. It may be noted in this connection that the pancreatic juice, if removed soon after its entrance into the duodenum, is comparatively harmless since its most important ferment, trypsinogen, is relatively inert until activated by the succus entericus of the duodenum.

Before this audience, it is superfluous to insist on early operation, but it must be urged on those whose experience with abdominal traumatisms is only occasional. Hertle tells the story in his analysis of 109 cases of intestinal rupture: Of those operated on in the first 6 hours, 48% died; during the 7th to 12th hour inclusive, 54% died; during the 13th to 24th hour, 79% died; during the 24th to 48th hour, 93% died. Later than 48 hours, 80% died (in 16 cases the time of operation is not given). The abdomen should be opened on well-grounded suspicion,—when the diagnosis is sure the golden moment may have passed. The writer's experience has convinced him that in case of a pedestrian struck by an automobile, a concussion of the brain must be regarded as a fractured skull or brain laceration, and a contusion of the abdomen as a rupture of a viscus until proved otherwise, and that the reliable story of the passage of an automobile wheel over the abdomen justifies, or even demands, intervention.

BIBLIOGRAPHY.

[1] Berry and Giuseppi: Traumatic Rupture of the Intestine, etc., Proc. Royal Society of Med., London, 1908, II. Surg. Section, p. 1.

[2] Hertle: Ueber stumpfe Verletzungen des Darms und des Mesenteriums, Beitr. z. klin. Chir., 1907, liii.

[3] Travaststjerna: Quoted by Hertle.

[4] Meerwein: Duodenalverletzungen durch stumpfe Gewalt, Beitr. z. klin. Chir., 1907, liii, 496.

[5] Kanavel: Duodenal Toxemia Following Rupture of the Duodenum, Jour. Amer. Med. Asso., lxii, No. 10.

[6] Maddock: Rupture of Duodenum Caused by a Blow, Brit. Med. Jour., 1, No. 2781, April 18, 1914.

[7] Keller: Ueber Retroperitoneale Duodenalrupturen, Beitr. z. klin. Chir., xc, No. 2.

[8] Pannett: Treatment of Duodenal Fistula, Lancet, 1, No. 4729, Apr. 13, 1914.

[9] Mayo: Accidental Injuries to Descending Duodenum During Removal of Right Kidney, Jour. Amer. Med. Asso., lxii, No. 5.

[10] Mayo: Procedures Following Nephrectomy, Jour. Amer. Med. Asso., lxiv, No. 12.

[11] Personal communication.

[12] Personal communication.

IV.

CHOLELITHIASIS. AN ARGUMENT FOR EARLY OPERATION.*

BY JOSHUA C. HUBBARD, M.D., BOSTON.

AFTER the symposium on cholelithiasis at the meeting last year there is little to be said on the subject. There is, however, one point I wish to emphasize in this paper. The facts to prove it I shall not deduce from many statistics compiled from many sources, but from the records of one institution only, both autopsy and clinical. The general statement is this, that as soon as the diagnosis of gall-stones is made it is the duty of the doctor in charge, subject to possible complications, to advise operation. The

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profession and the public have been brought to the realization of the necessity, in certain diseases, of immediate or early surgical treatment. Appendicitis, for instance, is now recognized by the public as a disease for surgical treatment. In fact, I have sometimes found the physician recommending operation more strongly than the surgeon. In this list of diseases for early operation cholelithiasis has a place, I believe, and I think I can prove the truth of my statement, that with the establishment of a diagnosis of gall-stones, the treatment becomes surgical. There may not be, as in appendicitis, the necessity for immediate operation, but the necessity does exist for early surgical interference.

Before going on to the actual proof of my belief let us review for a moment the life history, as it were, of a gall-stone. We know that gall-stones are found in the great majority of cases in the gall-bladder itself rather than in the ducts. The one necessary factor (according to Osler) for the formation of gall-stones is a low grade inflammation of the biliary tract. This inflammation is started by microörganisms, usually typhoid or colon bacilli, which, reaching the liver through the circulation either portal or general or by the common duct from the duodenum, induce a low grade cholecystitis.

The second requisite for the formation of stones is an obstruction to the outflow of bile from the gall-bladder. This may be due to a general muscular inactivity or to some mechanical obstruction.

This inflammation and stagnation then bring about in the gall-bladder a desquamation of the lining epithelium, an albuminous exudation and an increased formation of mucus and cholesterin, and a precipitation of the biliary salts, and thus the formation of a gall-stone.

A stone formed in this manner remains quiescent in the bladder until its presence causes secondary changes or so much irritation that it is expelled through the ducts with the resulting symptoms of colic.

My proof that cholelithiasis is a disease for operative treatment is established from two sources, clinical and autopsy. First, let us consider the clinical proof.

In a series of 220 cases operated upon at the City Hospital, 31 died. Why did these 31 die? Because they were more seriously diseased than those who recovered. This was shown by the greater frequency in them of chills, jaundice, enlarged liver, and a palpable mass in the region of the gall-bladder. The condition of the gall-bladder itself and the situation of the stones also showed greater severity of the progress. The bladder was inflamed, necrotic, perforated or contained pus in a large proportion, 8 out of 31, and stones in the ducts were found in half the cases, 16 in 31. The actual causes of death were sepsis, pulmonary complications, and a progressive general weakness. Why were these cases more severely diseased? Because the stones had been present so long in the gall-bladder that they induced secondary changes in the bladder itself, infection, necrosis, perforation, or in the liver itself, or they had gradually been expelled from the bladder into the ducts. Could these stones have been removed from these patients before the secondary changes had induced a more serious condition, the operations would have been less severe. Removal of a stone from the common duct subjects the patient to a more severe operation than removal of stones from the gall-bladder. Could, therefore, these patients have been operated upon early, some, at least, would not have died, for the mortality of cholecystectomy or cholecystostomy is between 3 and 4%.

From a clinical point of view, therefore, operation as soon as possible after the establishment of a diagnosis offers the best prognosis.

The advantage of early operation is shown even more clearly by an examination of autopsy records. All autopsy records at the City Hospital were examined, to determine the cause of death where a gall-stone was found post mortem. Cases from the surgical wards in this list were few, for the stones had been removed ante mortem by operation. Cases dying in the other divisions of the hospital, therefore, make up the greater number of the cases. There were 108 autopsies where a gall-stone was found. In 76 cases the stones were found in the gall-bladder only. Of these 76, nine died as a result of the presence of the stones, the causes of death being hepatitis, cancer of the gall-bladder, pancreatitis and abscess of the liver.

Among the 108, 32 had stones which had passed from the gall-bladder into the ducts. In 14 of these death was due to the gall-stones, the causes of death being abscess of the liver, peritonitis, and cholecystitis. In other words, gall-stones in the gall-bladder killed in 11%, while stones in the ducts killed in 43%. What could be a greater argument than this for operating early, while the stones are in the gall-bladder? The relative mortality that this series of cases of gall-stones shows to exist between those operated upon early and those treated surgically, late or only after complications have arisen, is convincing evidence for prompt surgical interference as soon as the diagnosis has been established.

I collected these figures with an unbiased mind and not to prove any preëxisting idea of my own. They showed so clearly the advantage of early operation that I have ventured to bring them before you. It seems to me now that it is our duty to educate the public to accept operation as readily in cholelithiasis as in acute appendicitis.

These clinical and autopsy records, if they show anything at all, show that the prognosis in cases of gall-stones is dependent on the length of time the stones have been present. In a given individual the earlier they are removed the better the prognosis.

V.

A Brief Consideration of Acute Pancreatitis With Case Reports.*

By Charles E. Durant, M.D., Haverhill, Mass.

I shall make an effort in this paper briefly to review the subject of acute pancreatitis; in addition, I shall present abstracts of five cases, which I have personally observed, and in four of which I have operated.

It is well understood by those who have had personal experience, and by those who have made a careful study of the literature, that the condition in question is one of the greatest importance, because: (1) it is relatively infrequent; (2) it is not always easy of recognition, and therefore, perhaps often overlooked in the beginning; (3) in some instances, it is tremendously rapid in its course and fatal in its termination, and (4) in all cases, early diagnosis and prompt operation are essential to success. Granting the truth of these propositions, there should be some advantage in restating the problem, with the idea at least of renewing old impressions grown dim, it may be, through the inexperience of scant opportunity.

As regards the cause of pancreatitis, one is surer of the fact of infection than he is of its *modus operandi* in many cases; the colon bacillus is, as one would expect, the organism most commonly present. One of the most significant clinical facts concerning pancreatitis is the frequency with which it is associated with gallstone disease. In passing, the citation of a few statistical groups may be made, to indicate how often the two conditions are found together. Thus, Egdahl in 105 cases found 42% complicated with gallstones; Körte, 47% in 44 cases; Dietrich, 50% in 16 cases; in the London Hospital, 11 autopsies in cases of acute pancreatitis, showed gallstones present in 7, or 63.6%. It is unnecessary and superfluous to multiply statistics, for the proportion is practically the same in the reports of other observers. Such figures are significant, inasmuch as they establish definitely a relationship which cannot be disputed.

Opie demonstrated years ago that a calculus impacted in the ampulla of Vater caused regurgitation of bile through the duct of Wirsung, and that bile injected into the pancreatic ducts, produced pancreatitis of typical pathology. These observations are fundamental and serve to explain in a definite way the development of certain cases of pancreatitis associated with cholelithiasis.

The problem would indeed be simple, if calculous impaction of the ampulla of Vater were always found, for the rationale of the process would be at once apparent. But it is important to note that when gallstones are present, only 20% are found in this location. Moreover, it has been shown that a calculous impaction of the common duct in the ampulla will be followed by direct regurgitation of bile into the duct of Wirsung in only 30% of the cases. This is to be accounted for by anatomical variations. It is obvious, therefore, that infection of the pancreas in gallstone cases, involves other factors than simple regurgitation of bile through mechanical influences. Efforts to explain the mechanism of infection in cholelithiasis without impaction in the ampulla have been made by Deaver, who claims direct and definite communication between the lymphatics of the gall-bladder and the pancreas, but recent experiments indicate that invasion by this route cannot be proved and is, moreover, improbable.

In addition to the work of Opie, many other laboratory experiments have been made by injecting solutions of various chemicals, extracts of intestinal juices, diluted bacterial cultures, etc., into the pancreatic ducts and into the pancreas itself. The story of these experiments is long and technical; the results are neither uniform nor definite, and their recital would be unprofitable in a clinical survey. The conclusions of Polya, quoted by Sir Frederick Eve, may be accepted as a brief and fairly complete resumé of our present knowledge. "Typical pancreatic necrosis, with hemorrhages, fat necrosis, and a rapidly fatal course, may be originated most certainly, with strongly active trypsin solution, less constantly, by duodenal contents, and by bile mixed with bacteria, rarely by the contents of intestinal fistulae, and extract of intestinal mucous membrane, and only exceptionally by bacteria alone." Can it be denied that the problem is complex and needs further elucidation?

Cases of pancreatitis have been reported in association with non-calculous inflammation of the gall-bladder and bile passages, which presumably bear the same relation to the bilary infection as has been referred to in gallstone cases with impaction in the choledochus—at present unexplained.

In cases arising in the course of such diseases as typhoid and gastric ulcer—a not inconsiderable number— direct invasion of the duct of Wirsung or the duct of Santorini may be assumed. On the other hand, when pancreatitis occurs as a complication of mumps, and quite a number of cases have been reported, we may reasonably conclude that infection takes place through the blood stream. Clinical observations seem to indicate that males are more often affected than females, that the subjects of pancreatitis are likely to be obese, and that alcohol has some apparent predisposing influence. Moynihan states that a very considerable number of cases occur in pregnant women at about the third month of pregnancy.

I need dwell but a moment on the pathology of pancreatitis. The gland is swollen and soft; mottling due to hemorrhage is seen; also fat necrosis, both within the gland and on the omentum and mesentery. In certain cases, extensive fat necrosis even to complete sphacelation of the

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entire gland may occur with great rapidity. In the less severe forms of infection, the necrotic process is more limited and a localized abscess results, often invading the peripancreatic fat, and sometimes occupying a considerable space in the lesser omental bursa. Serous or bloody effusion is usually present in both greater and lesser sacs. General septic peritonitis is frequently the terminal event, either by direct extension of the process itself, or as the result of the rupture of an abscess.

Mikulicz suggests the pathological analogy between acute pancreatitis and phlegmon, in which the process shows different degrees of intensity, varying from the mildness of simple furuncle to a more or less extensive destruction of the organ, with involvement of the retro-peritoneal tissues and the sub-phrenic space. Körte goes so far as to say that "Only a small number of cases of pancreatitis reach the stage of necrosis, the majority dying from acute inflammation"—and of course, toxemia— "before that stage is reached."

The clinical picture of this condition is strikingly illustrated by Fitz in his classic monograph of 1899.

"Acute pancreatitis," he says, "is to be suspected when a previously healthy person, or sufferer from occasional attacks of indigestion, is suddenly seized with violent pain in the epigastrium, followed by vomiting and collapse, and in the course of 24 hours, by a circumscribed epigastric swelling, tympanitic or resistent, with a slight rise of temperature."

This description is concise, exact and complete—nothing of importance has been added to it, and all subsequent observations have confirmed its value. The clinician will do well to remember these words of Fitz, for they will help him easily to visualize and more readily to recognize "one of the most serious diseases which he is ever called upon to treat."

Notwithstanding this clear cut definition, acute pancreatitis is by no means always easy of recognition. After many years of extensive experience in abdominal surgery, the late Dr. Maurice H. Richardson remarked as follows: " I have never seen enough of this disease to feel confident of my diagnosis when I have made it. From the nature of things, no man is likely to recognize with confidence the disease—from its infrequency, if for no other reason. Were these acute infections of the pancreas—or for that matter of the upper abdomen from whatever cause— as common as infections of the appendix, the surgeon would soon be able to recognize the clinical picture. As it is, he sees so infrequently that picture, that a study of it reminds him of the truth, but does not recall it vividly and beyond mistake."

A history of previous attacks of epigastric pain or distress is often present, as Fitz remarks, in cases in which pancreatitis should be suspected; these attacks may be due to ulcer, gallstone colic, or to slight pancreatic hemorrhages, which are said often to precede a definite attack of acute pancreatitis. Cyanosis of the face or abdomen has been referred to by Halsted and others as of special significance; it is present in some cases, but certainly not in all. One recent writer lays considerable stress upon a "splitting backache," particularly marked in the left lumbar region. This he regards as of almost pathognomonic value.

In differentiation, one must first give careful attention to the possibility of perforative lesions of the gall-bladder, duodenum and stomach. Perforation of the gall-bladder, while by no means rare, is not common, and is most likely to be preceded by definite historical evidences of cholelithiasis, or general and localized manifestations of acute inflammation. The pain of perforation of the stomach and duodenum is, often enough, overwhelmingly prostrating at its onset, perhaps even more so than in pancreatitis, and as a rule, less easily relieved by morphine. One observes, furthermore, in this condition, the development of generalized, board-like rigidity of a very distinctive type. In pancreatitis, on the contrary, the rigidity is less marked, and is limited to the epigastrium, where one finds in addition tympanitic distention, with perhaps, a sense of deep resistance. Moreover, evidences of shock and collapse, in association with perforation, are of relatively short duration, and patients seen within a few hours after the initial pain, are not usually found in shock. This free interval, so to speak, persists until the appearance of peritonitis, which changes the picture for the worse. In pancreatitis of the fulminating type, evidences of shock and great depression continue from the beginning.

It is my belief that acute pancreatitis is more often mistaken for acute intestinal obstruction than any other condition. The initial vomiting, and rapidly developing distention of the upper abdomen, are certainly suggestive. In pancreatitis, there is, furthermore, marked inhibition of peristalsis from shock and toxemia, so that the passage of flatus is limited and difficult, and enemata in this condition are by no means followed by satisfactory evacuations either of gas or fecal matter. If one carefully analyses the symptoms, however, he will find that the pain of pancreatitis is more persistent, not intermittent or colicky in character, that the degree of early shock produced is much greater than in ileus, and that flatus can be, and usually is, passed in small quantities, voluntarily or after the use of enemata. Another point of importance in favor of the presence of the pancreatic lesion, is the localized tenderness in the epigastrium, which is marked and persistent, as has already been pointed out, and which one fails to find in early high obstruction in the intervals between the periods of intestinal spasm.

In spite of the difficulties which all admit, it seems to me that a careful, even though rapid analytical consideration of evidence along these lines, will enable the observer to arrive at a

reasonably probable diagnosis of pancreatitis in most cases, if he holds it in his mind as a possibility when dealing with the acute emergencies of the upper abdomen.

The prognosis in pancreatitis depends upon the intensity of the inflammatory process. In the hyperacute variety, it is obviously exceedingly grave; it could not be otherwise when we consider how rapidly wide-spread necrosis occurs, accompanied as it often is, by a prostrating and deadly toxemia. In the milder grades of inflammation, showing less tendency to rapid necrosis, the outlook is more favorable. If suppuration occurs, and the condition is recognized before the development of peritonitis or other complications, there is a fair chance. Without attempting to particularize by the citation of statistical data, which even now are somewhat limited, it may be confidently asserted that early diagnosis and prompt operation have materially improved the prognosis, and further improvement can be looked for only along these lines. Admitting the truth of these generalizations, it is clear that an early diagnosis is imperative, and that even a reasonably probable diagnosis constitutes an absolute indication for operation.

The operative procedure may be described as follows: A median epigastric incision is made; if pancreatitis is present, a quantity of dirty, brownish fluid will usually escape. This is suggestive, but not distinctive. It may be said in passing, that in the early cases where surgical interference was practised, drainage of this fluid without direct attack upon the pancreas itself was considered sufficient; such simple measures were proposed by Hahn and followed by him, Pels-Leusden, Wolsey and others, all of whom have reported successful cases. An examination of the omentum will reveal the presence of the small, yellowish-white spots of fat necrosis in scattered areas. This sign is always definite, and positive evidence of a lesion of the pancreas, and further procedure should be directed towards that viscus. To reach it, three routes have been employed: first, above the stomach through the gastrohepatic omentum; second, below the stomach through the gastrocolic omentum, and third, through the transverse mesocolon. The objection to the route above the stomach lies in the fact that when the stomach is in a high position, it does not give easy access to the pancreas, and for this reason it is not desirable. The route through the transverse mesocolon, while giving easy access to the more central portions of the gland, does not allow one readily to reach its lateral extensions, unless a large rent is made in the mesocolon, which is to be avoided. Furthermore, this approach affords no opportunity to protect the lower abdomen from dangerous extravasation. The best route of all, it seems to me, lies through the relatively thin and less highly vascular gastrocolic omentum. A longitudinal tear of moderate length brings one at once to the pancreas. As much of the continuity of the pancreas as can be reached, should be examined for softened areas, and wherever found they are readily and safely opened by blunt puncture with the urethral sound or some similar instrument. This method suggested by Körte is, in my opinion, of the greatest value. The instrument may be pushed into the gland in various directions, chiefly, of course, laterally, for a considerable distance, sufficient indeed to allow the introduction of a drainage tube directly into its substance. It is not possible, in my experience, to hold the tube in position by the use of sutures, but it may be retained with sufficient security by packing about it a good-sized gauze tampon surrounded by rubber dam. It is my impression if the patient does well, one should be in no hurry to remove either the tube or the tampon; I should think it had better be allowed to remain for a period of from five to seven days. I have not referred to the question of a counter incision in the loin, for the reason that such a procedure would be more applicable in subacute cases with abscess formation in the lesser sac. In cases where the trouble is limited to the head of the pancreas, Körte has suggested and practised mobilization of the duodenum to the left, following the Kocher procedure for impaction of stone in the ampulla of Vater. It is clearly the duty of the surgeon to examine the gall-bladder and bile ducts, to determine the presence or absence of cholelithiasis, but I cannot be persuaded that any operative interference should be attempted looking towards the removal of gallstones or drainage of the bile tract under circumstances so critical. If gallstones are found to be present, I believe their removal can be more safely accomplished at a later time, if the patient recovers. I apprehend that in most of these cases, vigorous measures will have to be employed to combat shock, which is usually present in considerable degree when the operation begins.

The following list of cases, briefly abstracted with some comments, is appended:

CASE 1. Male, 52, of alcoholic habits, and a previous history of repeated attacks of what was supposed to be gallstone colic. He was taken sick 48 hours before operation with a sudden, severe, epigastric pain, vomiting and constipation. The severity and urgency of his condition became increasingly apparent, and he was sent to the hospital. Examination showed an obese man, having a small, rapid pulse of poor quality, temperature 101.2°, face anxious, and quite cyanotic. A marked degree of shock was evidently present. Vomiting still persisted and the bowels did not readily respond to enemata, although some gas was expelled and a small quantity of fecal matter. There was marked distention of the upper abdomen, with tenderness on pressure over this area, and some degree of muscular spasm. The urine was free from sugar. On the question of diagnosis, perforation of the gall-bladder was thought of and could not be positively excluded; on the whole, however, the condition seemed to be too severe and to have developed too rapidly to warrant this conclusion. In perforation of the stomach or duodenum, one would have expected more generalized rigidity and less shock. Intestinal obstruction was

excluded by the escape of small amounts of gas and feces. A diagnosis of acute pancreatitis seemed probable. The abdomen was opened immediately; the peritoneal cavity contained a quantity of dirty, brownish fluid; spots of fat necrosis were found scattered widely over the omentum. The patient suddenly collapsed and died on the table. I made an incision through the transverse mesocolon exposing the pancreas. It was swollen throughout, softened, and, on section, showed the characteristic mottling of the acute hemorrhagic form of infection. The gall-bladder contained many calculi.

This case was typical clinically in all respects, and the result was what might have been expected. The presence of gallstones made it practically certain that biliary infection was also present—an additional feature of one of the classical types of pancreatitis.

At that time I should not have attacked the pancreas directly, but intended to drain the abdomen after evacuating the septic fluid. This view was based on a knowledge of the work of Hahn, Pels-Leusden, Wolsey, Halsted and others who had reported successful cases treated by this method.

The importance and value of early direct attack upon the pancreas for purposes of drainage and to prevent necrosis is now generally recognized. Necrosis often rapidly supervenes as has already been pointed out. In Körte's list of 38 operations, there were 34 in which this procedure was carried out; of these 18 recovered and 16 died. In four cases no effort was made to drain the pancreas—death resulted in each instance. No operation should be considered complete unless this is done.

CASE 2. Obese female, 53, single, admitted to the hospital Oct. 23, 1909, with a diagnosis of "gallstones." She complained of epigastric pain, moderately severe in type, vomited bile persistently, and belched great quantities of gas. The bowels could not be moved satisfactorily by repeated doses of cathartics and enemata. The upper abdomen was distended and there was marked tenderness, especially under the right costal border. The urine showed ½-1 per cent. of sugar on several examinations. The temperature had averaged about 101°, and the pulse, about 120 from the beginning of the attack. No jaundice. It was thought by the attendant that the patient was suffering from partial obstruction, or possibly gall-bladder inflammation. A conservative point of view was held as long as she did not grow rapidly worse. I saw her on Nov. 14, about three weeks after entrance, and the question of the presence of pancreatic disease was raised. It was, we thought, sufficiently strongly suggested to warrant an exploration, and on the following day this was done. Cloudy fluid was present and extensively distributed fat necrosis. The pancreas was investigated through the transverse mesocolon; it was generally swollen, and in one place, just to the right of the median line, very much softened. On making an incision at this point, there was a gush of pus. At no other point could definite fluctuation be detected. The opening was enlarged sufficiently to allow the introduction of a good-sized rubber tube. Gauze was packed around the tube, and the abdomen partly closed. Gallstones were present in the gall-bladder. The patient died on the second day from shock and exhaustion.

This case, presumably primarily of biliary origin, represented, in my opinion, an old infection of the pancreas, with involvement of the islands of Langerhans, as indicated by the presence of sugar in the urine. Incidentally, it may be stated that the presence of sugar in the urine, in the acute cases, is considered of no particular diagnostic value. The final outbreak of subacute inflammation and abscess was probably the result of a fresh infection. It seems reasonable to suppose that an earlier operation would have saved this patient. My procedure, in this case, was more radical than in the first case, in that I made a direct attack upon the pancreas, but I believe it would have been better to approach through the gastrocolic omentum.

CASE 3. Male, 36, mildly alcoholic, had grown rapidly obese in the last two or three years. History of stomach trouble for some time, and one or two attacks of "acute indigestion." The onset and rapid development in this case were absolutely typical. After a few hours' observation there remained no doubt in the minds of the patient's two medical attendants and myself as to the diagnosis. Extreme and agonizing pain, great shock, and persistent vomiting with upper abdominal distention and tenderness, characterized the picture. Considerable doses of morphine were required to relieve the intense suffering. Operation was considered, but the pulse was too rapid and of such poor quality that at no time did it seem in the least degree possible for the patient to withstand anesthesia. He died on the third day.

The autopsy showed that the peritoneal cavity contained a rather small quantity of cloudy fluid. The intestines were everywhere distended and congested although but little exudate was present. The pancreas throughout its entire extent was transformed into a soft, boggy, semi-liquid, greyish-green slough. The gall-bladder was normal, and contained no stones. No other pathological conditions were found. Apropos to the condition of the pancreas found in this case, Turnbull, quoted by Eve, commenting upon reported cases of complete sequestration, is inclined to doubt the possibility of its occurrence, and explains the finding as being due to necrotic peripancreatic fat. He cites two cases where "the house surgeon assured him that the whole pancreas had sloughed through a laparotomy wound, but in both instances, the pancreas was found in its normal position at the autopsy." In spite of the view of Turnbull, I am absolutely sure that the whole pancreas sloughed in this case.

One can scarcely imagine a case more typical of the fulminating variety than this, both clinically and pathologically. Perhaps operation would not have saved the patient; it certainly should have been done.

CASE 4. Female, 37, married, four children. History of irregularly recurring epigastric pains for five years, attacks always came on just after meals, never at night and were usually relieved by vomiting. Morphine had to be given several times. She

was told on different occasions that she was jaundiced and gallstone trouble was the cause assigned.

Twenty-four hours before operation she was seized with extremely violent epigastric pain; there was no vomiting. Morphine was given, but she grew rapidly worse, and was sent to the hospital with the diagnosis of probable acute pancreatitis. At entrance, her temperature was 100.5°, pulse, 120, of poor quality; patient looked very sick; epigastrium was distended and tender. Immediate operation—epigastric incision, brownish fluid in peritoneal cavity; fat necrosis on the omentum and mesentery; pancreas exposed through transverse mesocolon; found to be generally swollen and quite soft. It was punctured in two places near the middle with a steel sound, which was pushed into its substance readily in both directions. Rubber tubes were inserted into each puncture, and two cigarette drains were carried down to the pancreas. No gallstones were present. Following the operation, the patient did well; pulse steadily declined and registered 70 on the fourth day; temperature was normal on the ninth day. There was a profuse discharge of foul-smelling pus throughout the patient's stay in the hospital, a period of 50 days. She was discharged in excellent condition, with a sinus still persisting. This fistula did not heal, and a little more than a month later, she was readmitted. After being in the hospital about a week, a calculus the size of a small pea came away; from that time on, the discharge grew progressively less and about six weeks later the wound was soundly healed. The patient suffered from occasional mild attacks of epigastric pain for six months following the closure of the wound; ten months later, she gave birth to a child. She now states that she has been in absolutely perfect health for a year.

Körte remarks that "The time of healing in all those cases in which there was a discharge of necrotic pieces of the gland or fistula formation was very long—from two to seven and a half months. In only a few of them in which there was such discharge was the healing completed before one and one-half months."

CASE 5. Male, 67, previous history of indefinite stomach trouble, and at least one attack of pain in the upper abdomen requiring morphine for its relief. Aside from this and the general "slow down" of advancing years, his health had usually been very good. Seventy-two hours before I saw the patient, he was taken with sudden, severe epigastric pain and vomiting. Morphine in considerable doses was given. It was thought that he had intestinal obstruction and immediate operation was advised. He declined to follow this advice because of Christian Science leanings and rather compelling Christian Science influences, so it is said. When I saw him, he was suffering greatly from pain in the upper abdomen, tossing about the bed, and often getting up and walking around the room. The abdomen was generally distended, but especially so in the epigastrium, where there was very marked diffuse tenderness, an indefinite sense of deep resistance and muscular spasm. His pulse was 100, of poor quality; temperature slightly subnormal. I was told that his bowels had moved but slightly since the beginning of the attack and that he had vomited frequently. He was taken to the hospital and operated upon at once. When the abdomen was opened, spots of fat necrosis were quickly evident; there was considerable fluid in the peritoneal cavity; the intestines were greatly distended. The gastrocolic omentum was torn through and the pancreas exposed. It was swollen and soft. I made several punctures with a steel urethral sound, but nothing escaped from the punctures except bloody fluid. Two good-sized rubber tubes and two cigarette drains were placed in contact with the pancreas. No gallstones were present. The abdomen was partly closed.

Following the operation, the distention increased steadily, became most distressing, and could not be relieved by enemata. The patient vomited persistently after the first two days in spite of lavage; on the third day, he became irrational and died deeply stuporous on the seventh day of general peritonitis.

The gravity of this case was recognized in the beginning when the patient had his best chance. If he had seen fit to accept the suggestion of his medical attendants, even though they thought he had ileus, his life might have been saved, especially as the process of disintegration in the pancreas was not found far advanced at operation. Toxemia seemed to be out of all proportion to the local destruction of tissue. The diagnosis did not seem difficult.

There are no new conclusions to formulate as a result of this brief clinical survey. The urgency of the condition has been pointed out in speaking of the pathology, particularly in relation to the rapidity with which necrosis occurs in some cases; the overwhelming toxemia has also been referred to, as a factor of great importance in the same connection; this feature was well exemplified in case three. Even in instances where the onset is less severe and where more or less localized suppuration follows, such serious and probably fatal complications as subphrenic abscess, extensive suppuration in the peripancreatic fat, or general peritonitis may be looked for. The danger of hemorrhage in cases of persistent sinus was not mentioned in the body of the paper, but it is not to be forgotten. In view of all this, it seems unnecessary further to press the point except in closing formally to urge upon the practitioner the great importance of early diagnosis and prompt operation in acute pancreatitis.

I desire to acknowledge my indebtedness to Drs. Croston, Clarke, Donahue and Sullivan of Haverhill, through whose courtesy I was given the opportunity of seeing four of the cases herein reported.

REFERENCES.

[1] Cemach: Chirurgische Diagnostik, Wien, 1914.
[2] Erdmann: N. Y. Med. Jour., Jan. 24, 1914.
[3] Eve: London Lancet, Jan. 2, 1915.
[4] Hahn: Deutsch. med. Woch., 190, v, p. 5.
[5] Körte: Annals of Surgery, Jan., 1912.
[6] Linder: Surg., Gyn. and Obs., Feb., 1915.
[7] Mikulicz: Annals of Surgery, July, 1903.
[8] Moynihan: Abd. Operations, 1914, p. 391.
[9] Pels-Leusden: Deutsch. Zeit. f. Chir., Sept., 1903.
[10] Richardson: Surg., Gyn. and Obs., May, 1912.

DISCUSSION OF THE PAPERS OF DRS. WALKER, CHEEVER, HUBBARD AND DURANT.

DR. P. E. TRUESDALE, Fall River: In regard to perforating gastric and duodenal ulcers, my observations are limited to the experience of ten operative cases with two deaths. It seems to me that what happens to these patients in the first twelve hours is of considerable importance, and vitally affects the outcome. As a rule the patient demands relief, is given a hypodermic of morphia, and is put to bed. There he is quiet. The perforation remains open and fluid continues to escape. On the other hand, if he is left to his own devices, what happens? He does not go to bed. The last case I had gave this history: The patient was in bed and was taken with the pain at three o'clock in the morning, got up and sat in a chair. This gave him a spontaneous closure, stopping, in a measure at least, the escape of the contents of the stomach.

In applying a surgical procedure for this lesion, it seems to me that one should be guided almost entirely by the picture which is presented at the time of operation. Each surgeon must determine for himself what he can do most swiftly and effectively to close the opening and institute adequate drainage. The size of the perforation and the amount of induration surrounding it, makes closure easy or difficult. If the opening is small, the induration not marked, and the bowel lumen ample, a rapid and efficient closure can be made. Gastroenterostomy in the presence of such a picture is uncalled for, and when done carries with it an added risk, increased by the presence of an acute lesion. However, if one should find the perforation to be ½ to 1 c.m. in diameter, and the center of an indurated mass which has already encroached considerably upon the bowel lumen, the problem confronted is more difficult. Sutures are difficult to apply; they are often left under considerable tension, and when they cut out the opening may thus be made larger than it was originally. Final suture then should not be under tension. When the infolded mass is bulky and greatly encroaches upon the bowel lumen, gastroenterostomy should be done, even at the expense of an extra half hour. The wisdom of doing gastroenterostomy in every case is doubtful.

It is a notable fact, however, that occasionally the utterances of a master surgeon have led an average surgeon into deep water. For example, Dr. Deaver advocates gastroenterostomy in addition to closing the perforation. He has reported a series of thirty-two cases with one death, and he almost invariably does gastroenterostomy. He says that ten or twelve minutes more are utilized in doing gastroenterostomy. All this must be taken into account when considering the chances of recovery for the patient. Therefore, it seems to me that when you are in doubt about doing gastroenterostomy, don't do the gastroenterostomy.

DR. D. F. JONES, Boston: I will add just one word in regard to Dr. Cheever's paper concerning perforating ulcer. Dr. Cheever gave the impression that the reason he cured his 32 cases was because he had done a gastroenterostomy. He neglected to say that all of the cases which recovered had been operated on in twelve or fourteen hours after they were diagnosed. This is the whole point of the paper, and not his gastroenterostomy.

I wish to mention a case in my experience where there was a duodenal fistula, probably due to necrotic abscess, with sloughing of the duodenal wall, and a discharge of all the stomach contents through the duodenal fistula. The man went down to the lowest possible point, and when he was about to die we decided to do a jejunostomy. That was done and the man was fed by a tube through the jejunum. This kept the wound dry, and gave the wound a chance to heal. We were able to feed him by the jejunostomy for some three weeks. At the end of that time the fistula got along perfectly well.

In a number of reported cases of injury to the jejunum or duodenum, gastroenterostomy was done. It seems to me that a jejunostomy is the more satisfactory operation, in that the stomach contents do not have to be pushed through the injured intestine at all, but you can feed your patient by jejunostomy.

In regard to Dr. Durant's paper, I was sure that he meant to cover the whole field, and I therefore looked up the cases of pancreatitis at the Massachusetts General Hospital to see how frequently they occur. I found that in ten years at the Massachusetts General Hospital, that is, from 1904 to 1915, there were but 28 cases operated on surgically. Those cases were divided as follows:—acute, 10 with six deaths, or 60%; acute hemorrhagic pancreatitis, five cases, five deaths; chronic, 12 cases with three deaths, 25%. There was one case of gangrenous pancreatitis and one case of abscess of the pancreas, both of which recovered.

In regard to gall-stones in connection with pancreatitis, I think they are almost always present, although in the cases at the hospital there were but six cases of gall-stones, at least where they were noted at the time of operation. There was one case of ulcer of the stomach in connection with the pancreatitis.

Another interesting fact is that in the 28 cases, seven of them gave a history of previous attacks of pain, and in six of the seven cases there were no gall-stones present to give the symptoms. You will find, I think, in a very large percentage of cases of pancreatitis, attacks of pain which cannot possibly, I believe, be distinguished from gall-stones. The diagnosis, as Dr. Durant says, is very difficult. If one could see them more frequently one could undoubtedly make a diagnosis much more often.

While it may be of some importance to operate on these cases early, it is a fact that it depends greatly upon the conditions found at the

operation,—that is, the severity of the onset, as to whether the patient gets well or not. It also depends on the amount of blood or fluid in the abdominal cavity. As you know, there is the apoplexy of the pancreas in which patients die immediately, are found dead on the street. Those cases we do not see surgically because they do not get to the hospital alive. Then we have acute pancreatitis, in which there is no blood or bloody fluid, but in which there is straw-colored fluid. Of those cases, 40% recovered. In chronic pancreatitis cases there is no fluid whatever, simply a thickening of the pancreas. Practically all of these cases got well. Those cases are usually found in the course of other operations, usually operations for gall-stones. In the course of the gall-stone operation, the surgeon puts his hand down and examines the pancreas. It is found hardened and thickened. That is called chronic pancreatitis. Dr. J. H. Wright says that there is no condition like this found when patients come to autopsy. I do not know what becomes of the thickening; it is certainly there at the time of operation, but Dr. Wright says it is never there at autopsy.

In regard to Dr. Hubbard's paper, I feel that there can be no question that he is right in saying that whenever a diagnosis of gall-stones is made, the patient should be operated on. I think we are all coming to see that more and more.

Dr. F. B. Lund, Boston: I have very little to add, but I want to say one or two things. Dr. Walker's paper shows that there has been of recent years a great improvement in the matter of early diagnosis, and in consequence, a great improvement in mortality. It is very encouraging. The first successful operation for perforation of the stomach on this continent was performed by Dr. Atherton of Fredericton, New Brunswick, who was one of the earliest house officers at the Boston City Hospital. Perforations of the gall-bladder have been about as severe and more fatal in my experience than perforations of the stomach.

Dr. Hubbard's paper brings out the importance of early operation in gall-stones. We used to wait for an interval in appendicitis, but we do not do that any more. We also used to wait for an interval in gall-stones, but I have found that operations on acute gall-bladders, even gangrenous ones, often give as good result as waiting for an interval. While waiting, the trouble often gets worse, and I once saw pancreatitis result.

In regard to Dr. Durant's remarks, I have found jejunostomy very valuable in saving life through enabling a patient to be fed after operation for perforation. I had a patient recover who had a perforation operated twenty-four hours after it took place. The operation was followed by subphrenic abscess, and then by empyema, requiring operation, which weakened him so that I had to do a jejunostomy to feed him. After his strength had been restored by this, a gastroenterostomy was done, and he made a perfect recovery. We must never forget the possibilities of jejunostomy in these cases. Dr. Durant's paper covered the ground very thoroughly. I think there is a good deal of truth in the German author's statement that he quoted, who stated that, while there is a good deal of sloughing, which is thought to be sloughing of the pancreas, it is really the peripancreatic fat and not the pancreas that is concerned. I read a paper on this subject a good many years ago (fifteen, I think), and in one of my cases which came to autopsy there was a good deal of sloughing through the wound, which we thought came from the pancreas. At death a normal pancreas was found, so it looked as if this tissue must be peripancreatic fat. I am sure that sometimes a portion of the pancreas sloughs, but I think a great deal thought to be pancreas is merely peripancreatic fat.

Dr. Agnes C. Vietor, Boston: I would like to ask whether there are any statistics of the condition of the gall-bladder in acute pancreatitis, other than those relating to gall-stones.

Since, according to present evidence, it is the infection of the gall-bladder that is fundamental in the production of gall-stones, would it not be well for those of us who may meet cases of acute pancreatitis, to note not merely the presence or absence of gall-stones, but also the presence or absence of non-calculous cholecystitis?

Dr. I. J. Walker, Boston: It is surprising to learn the number of these patients who have been treated for stomach trouble, indigestion and various things like that, and have, perhaps, been rather indifferently treated. It seems to me that the important part in the prevention of these cases of perforation is to treat conscientiously the chronic ulcer of the stomach, or duodenum.

And again, Dr. Truesdale spoke of these patients wanting relief. That is, of course, perfectly true. The most of them need morphia, but they should not be left to stay in the house, and let things happen there. They should be sent to the hospital at the start, while the chance of recovery from operation is good.

Dr. C. E. Durant, Haverhill: Dr. Lund's statement in reference to the condition of the pancreas in his case fully confirms the view of Turnbull which I quoted. In my case, however —probably an exceptional one,—there was no question of practically complete sphacelation, for the pancreas was most carefully and thoroughly examined. The degree of destruction in so short a time was astonishing.

In reply to the question as to the frequency of non-calculous cholecystitis in association with pancreatitis, I am not able to make any statement based on statistical information. Furthermore, I am not aware of any reported cases where bacteriological investigations have been made looking towards the determination of this phase of the question. It is surprising that Dr. Jones, in the Massachusetts General Hospital cases, found fat necrosis reported in but 40%; I think this rather unusual, for Mikulicz, Körte,

and others report its presence with much greater frequency.

In operating in gall-stone cases, I have never been certain of my ability to make a diagnosis of chronic pancreatitis by palpation, and therefore, I was glad to hear Dr. Jones say that Dr. Wright feels that there is no such thing as chronic pancreatitis determinable by the operating surgeon.

Original Articles.

A PROPER CLASSIFICATION OF BORDERLINE MENTAL CASES AMONGST OFFENDERS.

BY V. V. ANDERSON, M.D., BOSTON.
Municipal Courts.

FOREWORD.

THE problems of our Courts, even more than those of the Psychiatrist, are *failures of mental adaptation.*

A great host of repeated offenders,—recidivisits who seem to be able properly to adjust themselves to Society's customs and institutions,—have as a fundamental basis of their lack of adaptability a mentality that deviates from normal, and would seem, if looked at purely from the social point of view, to be all of them defectives. They have been so termed by many observers.

Certain recent, purporting to be scientific, studies indicate the proportion of mental defectives among court cases as 89%, a condition wholly out of keeping with the common sense experience of judges, probation officers and others who have been dealing with delinquents. If such a universal cause could be discovered, why then a solution of the crime problem would be simple indeed; but such reports are not taken seriously inasmuch as the methods used were open to such grave criticism as to render the findings, for practical purposes, useless. Suffice it that the most reliable work done indicates a lower percentage of mental defectives among offenders in general, ranging from ten to thirty per cent. But what of the remaining seventy to ninety per cent? It has been on this particular problem that most of our interest has been centered, and this paper, while principally in the interest of a proper classification of borderline cases, forms an introduction to a series of contributions which will be made, calling attention to two very important types that have been overlooked.

One of the most urgent problems in the proper development of medical expert work in our criminal courts, is a workable classification of those borderline mental cases which belong neither to the feeble-minded nor the insane, and are yet clearly abnormal in mentality.

This paper will discuss the plan we have adopted of classifying these border line mental types in the Municipal Criminal Court of Boston. No reference is made to the various psychoses, to those suffering from alcoholic deterioration, to the epilepsies, etc., for obvious reasons. Our discussion simply has to do with a borderline group of individuals found amongst delinquents in general, who apparently have been very difficult to classify and about whom a most confusing terminology exists. They have been a source of much trouble to social workers, to criminal courts, and to various institutions. They seem unable to profit properly by any sort of treatment, and are suspected by those intimately associated with them of being "crazy," "born criminals," and what not. A more scientific terminology popularly applied is "moral imbecile," "moral insanity," "emotional defective," "defective delinquent," etc.

The terms being apparently used interchangeably, one physician may classify an individual as a moral defective, while another will diagnose him as a defective delinquent, and still another may call him an emotional defective, and so on. All the while the examiner may have only a vague conception of what he really means by his terminology.

Now for practical use in the study and treatment of offenders a classification should be definite, workable and based on demonstrable facts, rather than loose generalizations. Nothing is gained by categorizing individuals unless our classification conveys such well defined knowledge of types as will serve a practical end.

The term "defective delinquent" is being used by different examiners to define markedly divergent types. To some it means delinquent individuals who as a result of mental examination are found to be defective in mentality. Then the logical classification, from a mental standpoint, would be mental defectives. But other examiners are apparently using the term "defective delinquent" to cover a class of individuals who as a result of careful mental examination give no evidence of mental defect; but their conduct is abnormal, they have certain character defects, and they are anti-social,—they, forsooth, must be defective anyway, so why not call them defective delinquents? It is an easy way out of the difficulty.

Then there is a tendency to use the term to fit otherwise normal individuals who have criminal tendencies, presupposing that repeated criminality is proof of a defective mentality; a correlation wholly unjustified, unless we use the term defective as a social classification, and not as a mental: in other words, unless we are going to make "defective" refer simply to conduct that is abnormal and not in keeping with social standards, rather than back to its definite cause in a particular type of mentality.

Altogether we have presented to us a rather loose and confusing symptomatology connected with the term "defective delinquent," and when

the state is prepared to have these individuals committed to separate institutions, the difficulties of definition one fears will be insurmountable.

It would hardly seem necessary to discuss seriously such a classification as moral imbecile or moral insanity, did it not persistently crop up in the literature, and did not physicians now and then make use of such a diagnosis. To justify this classification one would have to presuppose the existence of a special moral faculty, an ethical department separate and distinct from the rest of the mental life; a presupposition wholly unjustified in the present light of scientific methods of studying the human mind.

In fact, we have come to realize that our moral judgments are inextricably mixed up with social judgments; that general intelligence, learning, experience, etc., are brought into play in the exercise of every moral judgment; that millions of brain processes are involved in every thought and act, and conduct is an expression of the whole machinery at work; that there is no ground for the presupposition of a separate sense that sits in judgment, approving or disapproving of our actions. In short, a mentality incapable of forming moral judgments is likewise incapable of forming normal judgments along other lines, and is (*ipso facto*) a defective mentality, and is demonstrable by a thorough examination of general intelligence, judgment, reasoning capacity, etc. These are *mental defectives,* and not moral imbeciles.

But the term is more frequently used to refer to a type of distinctly anti-social individuals who are not defective in mentality and are not lacking in capacity to form moral judgments, nor are they devoid of moral feelings, but are hampered with a constitutional instability of their nervous system which renders them very impulsive, vehement, inhibitionless and emotional; in other words, they are easily unbalanced, and thus especially liable to serious social difficulties in a complex environment. These are *psychopaths,* and not moral imbeciles.

A careful study of other supposed cases of moral imbecility brings to light victims of a vicious social environment, early immoral teachings and practices, individuals suffering from mental conflict, etc., etc. Healy has well said that the great probable sources of difference of opinions as to the existence of such a type is in the extensive theorizing and the lack of careful statement, either of definition, or of the results of survey of all investigable elements of mental life.

Certainly if in all cases of so-called "moral imbecility" the examiner would make a thorough study and record of the various mental abilities and disabilities of his patient, the self-contradictions so frequently found in the literature would hardly be possible. For our own part we find no need for the term as we have not yet run across a single case of moral imbecility or moral insanity.

But what serious objections are there to using the term "defective delinquent"? There are none, if by it we mean those delinquent individuals who are defectives. In other words, if we draw the line somewhere, restricting it to the mental defectives, making the term workable, and not allow it to cover several divergent types; else those of us who are having to do the practical work of classifying mental cases in courts and penal institutions will find the anomalous situation of a group of defective delinquents being composed of some offenders who are clearly *mental defectives,* some who are not defectives but are *psychopaths,* and others who are neither defective nor psychopathic in mentality, who are not pathological but psychological types,—the *mental delinquents.* Three distinct types, requiring entirely different treatment and offering a wholly different kind of prognosis from the standpoint of reformation. In other worlds, we will find that the term "defective delinquent" is a social classification and not a mental, and is being used to refer to acts, anti-social in character, which from the mental side have their basis in wholly different types of mentality.

As previously stated, there is no objection to calling those amongst our courts and penal cases, that are defective in mentality, "defective delinquents," nor is there any objection to calling those that are insane, "insane delinquents," and those that are epileptic, "epileptic delinquents," if we do not mean to imply that they belong to mental types different from the mental defectives, the insane and the epileptic. (But what is the use of it all? The very fact that one mental defective has been caught in his anti-social conduct, and another has escaped, is not sufficient grounds for a difference in mental classification of the two.)

If we do imply that the defective delinquent is a different type from the mental defective, then on what logical basis do we use the term as a mental classification,—for how can they be defectives and still not mental defectives? A contradiction. The term defective used with reference to the mind of an individual should carry with it a lack of normal mental development and should have a very definite meaning to us. This condition is demonstrable by exact methods of measurement. The term defective, used with reference to the social aspect of one's conduct, may as well be applied to those with a mentality that is disordered, as those with a mentality that is defective, and from such a point of view the majority of the fifty-odd thousand delinquents coming before our courts in one year could be classified as defective delinquents. The fact is that the term is being used constantly to refer to a group of individuals who, when their abilities and disabilities have been thoroughly and scientifically studied, give no evidence of mental defect, but are rated as adult in mental development. They are called defective delinquents, however, because they possess certain

personality maladjustments, certain character deviations, are distinguished by an anti-social line of conduct, are unreliable, changeable, impulsive, erratic, lacking in inhibitions, restless, at times showing great motor activity, becoming violent, and practically insane, under the influence of emotion, alcohol, drugs, etc. While under detention they clear up and give no evidence of psychoses or mental defect, only to have another outbreak when things go wrong in their environment. These are the *psychopaths*, as previously hinted at, and should not be confused with defectives. In institutions they give far more trouble than defectives, require a great deal more discipline, and seem little improved by any form of treatment. They are often absolutely unmanageable, and from the standpoint of our courts they require an entirely different disposition from the defectives, and must be clearly differentiated. One often finds enlarged thyroids; several cases seen by the writer had had both ovaries removed and had active changes in character dating from this incident, pointing, it seems, to the possibility of changes in certain internal secretions serving as a basis for this condition of nervous and mental instability. We must consider these individuals in the light of adjustment of their personality, rather than in terms of development of general intelligence, as we do the defectives; and realize that their anti-social conduct is due less to their stupidity, less to their lack of understanding of the demands of a normal social organization and inability to foresee the consequences of their acts, than it is to a disturbance in the coördination of the proper nervous mechanism; a poorly balanced mentality, rather than one that is defective. To call them "defective delinquents" confuses the issue, in that it emphasizes the social aspect, and is simply a social interpretation of their conduct; it does not point to the nervous and mental instability, rather than defect, that is the cause; furthermore, it allies them with the mental defectives, a type wholly different in mental makeup and treatment. The only logical classification that is free from confusion and serious criticism is the term "psychopath." This term fits so admirably the characteristics of this group, suggesting a relationship to the psychoneuroses and psychoses, rather than to feeblemindeness, that we have used it as a definite classification of this type from the first.

It might be well to mention that among several hundred offenders examined we have found almost as many "psychopaths" as "mental defectives," suggesting that this condition may be of as serious importance as a basis of criminality as mental deficiency, and it may be that it explains the wide divergence in reports as to the percentage of defectives among criminals; some investigators claiming as high as 89%, others as low as 20%. The latter is possibly nearer the truth than the former, inasmuch as 89% undoubtedly represents the entire field of this borderline group about which we are speaking, and thus includes not only the mental defectives but the psychopaths and mental delinquents as well.

Finally, after we have accounted for the mental defectives and the psychopaths among the recidivists, there still remains a very large group of repeated offenders who are not normal in mentality. Exact mental measurements fail to show any defect or sub-normality in mental development,—they are not defective. Carefully given psychiatric tests show no evidence of a psychosis; personality studies do not reveal any of the character makeup, temperamental peculiarities and disposition of the psychopath. They are not impulsive, poorly balanced and neurotic individuals; they are not lacking in inhibitions and liable to great emotional extremes, violent outbursts of temper, etc., as are the psychopaths, who are often quite conscientious and sincere and try repeatedly to do better, but fail because of their very marked nervous and mental instability. On the contrary, this particular type, the *mental delinquents*, have a fair amount of intelligence (depending upon the walks of life from which they come), a stable mentality, are cool and calculating, deliberate, planning out situations in advance, indolent and superficial, very selfish, egoistic, heartless, and even cruel at times. In them the self-preservative instincts are undisciplined and the nobler sentiments are lacking. They are strongly individualistic. In short, they possess a mentality that differs from the average or normal in that it is particularly non-social. It expresses itself as deviating purely along delinquent lines, and for this reason we have called them "mental delinquents," rather than defective delinquents, inasmuch as their mental condition is to be explained, as we shall show later, purely on psychological rather than pathological grounds; is acquired rather than innate. Their reformability is a well known fact, and thus their anti-social tendencies are not based on a lack of capacity for conduct in keeping with normal standards. These individuals have not had at the proper stage of their development those socializing influences which produce altruistic tendencies that discipline the instincts and emotions. The dominant note in their make-up is a non-moral and purely egoistic attitude, which tends to become more marked as character is formed around the unrestrained exercise of their primitive tendencies; tendencies which in themselves are normal, and present at certain stages of every individual's development, but which are checked when powerful inhibitions are laid down through fear of punishment, reward, expectation of social praise or blame, etc., which later on are to be reinforced through the growth of the higher and nobler sentiments that are of so much importance in the formation of character and the direction of conduct of individuals and societies.

We must remember in this connection that

character is not something born with an individual, but is built up on the native basis of disposition and temperament in the course of one's life and is the sum of acquired tendencies. There can be but little doubt that the sentiments constitute a large part of what is properly called character, and the organization of these we will remember, in the developing mind, is determined by the course of experience. Our judgments of value and of merit are rooted in our sentiments, and our moral principles have the same source, for they are formed by our judgments of moral value. Thus we can easily conceive how, if the raw material of virtue and vice are the same, and desires which in themselves abstracted from their relation to the higher self are neither moral nor immoral but simply non-moral, that the fundamental problem in a man's morality is his socialization by society. Now several things may take place to prevent this.

He may be so defective in mentality as to be unable to measure up to the standards and laws of a normal social organization, and thus constitutionally incapable of profiting properly by experience. In this case he is not a criminal but a "*mental defective.*"

He may be so unstable and poorly balanced in mentality as to be continually liable to impulsive conduct, and thus incompletely socialized, as are the "*psychopaths.*"

Or, as a result of acquired habits of thought and action, initiated during the formative periods of childhood and adolescence, he may have developed a character that is distorted and delinquent in its tendencies, and as a result he may be, for practical purposes, a "criminal" in his makeup. His environment may have focused upon him at some particularly weak moment a host of powerful influences, easily calculated to break down his weak inhibitions; especially is this true if the influences were exercised in the immediate service of desires springing directly from some one or other of the primary instinctive impulses. Now we have only to remember that habits are formed only in the service of instincts, and once initiated, how around them the entire character may be developed, for an acquired mode of activity becomes by repetition habitual, and the more frequently it is repeated the more powerful becomes the habit as a source of impulse, or motive power. In this way it is not difficult to understand how under particularly unfavorable circumstances the "*mental delinquent,*" or, in popular speech, the "*criminal type*" develops.

I submit then that among our borderline mental cases we have three distinct types, recognizable as definite entities, the *mental defectives,* the *psychopaths* and the *mental delinquents,* each creating very definite social problems; each having a very definite constitutional makeup and requiring for proper treatment and solution an entirely different line of handling, as we shall show in three papers that are to follow, entitled:—

(1) "Mental Findings in a Group of Psychopaths."
(2) "Mental Findings in a Group of Mental Delinquents."
(3) "A Comparative Study of the Mental Defective, Psychopath and Mental Delinquent."

In these three contributions it is our desire to call especial attention to a series of thoroughgoing personality studies by which we were enabled to arrive at an explanation of the makeup of these distinct types.

These three definite groups constitute the very backbone of recidivism, and the institution of proper remedial measures, fitting the requirements of each particular group, would enable society to make immense strides in handling the crime problem.

THE RELATION BETWEEN THE GENETIC FACTORS AND THE AGE OF ONSET IN ONE HUNDRED AND FIFTY SEVEN CASES OF HEREDITARY EPILEPSY.*

By D. A. Thom, M.D., Palmer, Mass.

From the records of the Monson State Hospital one hundred and fifty-seven (157) cases of epilepsy, each presenting in the family history one or more of the five mental defects into which I have arbitrarily divided heredity, viz., Epilepsy, Alcohol, Insanity, Feeblemindedness, and Migraine, were studied in view of determining the relation between the hereditary factor in the forebears and the age of onset of the epilepsy in the offspring; but as the work progressed other problems were presented that could not pass unnoticed and they will be considered as they occur.

Of the total number of cases used for this study, eighty-two (82) were females and seventy-five (75) were males. One hundred and twenty-six cases had direct heredity (that derived from parents or grandparents), and thirty-one cases had collateral heredity (that shown in members of the family other than parents or grandparents). There were two hundred and ninety-three (293) heredity defects in the one hundred and fifty-seven cases, occasionally one member of the family having more than one defect, and in other instances two or more relatives being defective.

Table I. shows the distribution of the five genetic factors among the total of two hundred and ninety-three taints recorded.

* Read at the Triennial Meeting of the Harvard Medical Alumni Association at the Boston City Hospital on May 20, 1915.

TABLE I.—HEREDITY—ONE HUNDRED AND FIFTY-SEVEN CASES OF EPILEPSY.

	Direct (126).							Collateral (31).										
	Mother.	Father	Mat. G. Mother.	Pat. G. Mother.	Mat. G. Father.	Pat. G. Father.	Total.	Sister.	Brother.	Pat. Uncle.	Mat. Uncle.	Pat. Aunt.	Mat. Aunt.	Cousin.	Uncle Unknown.	Aunt Unknown.	G. Father, Unknown.	G. Mother Unknown.	Totals.
Epilepsy	15	14	9	1	4	7	50	20	17	5	5	6	5	14	3	2			77
Insanity	4	9	2	3	2	4	24	4	4	2	1	4	2	7	1	2	2		29
Feeblemindedness	9	4					13			3	1				1				5
Alcohol	9	42			4	3	58		1										1
Migraine	25	7	1	1			34	1								1			2
	62	76	12	5	10	14	179	25	22	10	7	10	7	21	5	5	2		114

Table II. is a record of the number of times that each defect was found alone, the different combinations that were formed by a grouping of two or more factors, and the number of cases in each group.

TABLE II.—SUMMARY.

	Cases.	Per Cent.
ONE DEFECT IN FAMILY HISTORY.		
Epilepsy alone	44	28
Alcohol alone	23	14.6
Insanity alone	17	10.8
Migraine alone	9	5.7
Feeblemindedness alone	3	2
	96	61.1
TWO DEFECTS IN FAMILY HISTORY.		
Epilepsy plus alcohol	10	6.4
Epilepsy plus insanity	7	4.5
Epilepsy plus migraine	11	7.0
Epilepsy plus feeblemindedness	2	1.3
Insanity plus alcohol	4	2.7
Insanity plus migraine	7	4.5
Insanity plus feeblemindedness	0	
Feeblemindedness plus migraine	2	1.3
Feeblemindedness plus alcohol	1	.6
Alcohol plus migraine	3	1.9
	47	30.2
THREE DEFECTS IN FAMILY HISTORY.		
Epilepsy plus alcohol plus insanity	5	3.2
Epilepsy plus feeblemindedness plus insanity	3	1.9
Epilepsy plus alcohol plus feeblemindedness	1	.6
Epilepsy plus migraine plus alcohol	1	.6
Epilepsy plus feeblemindedness plus migraine	2	1.3
FOUR DEFECTS IN FAMILY HISTORY.		
Epilepsy and alcohol and feeblemindedness and migraine	2	1.3
	14	8.9

Ninety-six (61%) of the cases gave a family history of but one defect; forty-seven (30%) had two defects and the remaining fourteen cases (9%) had three and four defects.

Table III is but a further summary of Table II which brings out more clearly the total number of times that each one of the five genetic factors was met, either alone or in combination with one or more of the other factors, and also whether the heredity was direct or collateral.

TABLE III.—SUMMARY OF TABLE II.

	Alone.	Combined with Other Taints.	Total.	Direct Heredity.	Collateral.	Total.
Epilepsy	44	44	88 57%	49	39	88
Alcohol	23	36	59 38%	58	1	59
Insanity	17	26	43 27%	24	19	43
Feeblemindedness	3	13	16 10%	13	3	16
Migraine	9	27	36 23%	34	2	36

It will now be seen that from the entire one hundred and fifty-seven cases epilepsy was met either alone or in combination eighty-eight times (or in 57% of the cases), alcohol fifty-nine times (38%), insanity forty-three times (27%), migraine thirty-seven times (24%), and feeblemindeness sixteen times or 10% of the total number of cases. In 95% of the cases where alcohol, migraine or feeblemindedness was the defective factor the heredity was direct, while only 56% of epilepsy and insanity came from the forebears.

Table IV represents the distribution of the hereditary factors in those ninety-six cases where there was but one defect. It goes further and shows the frequency with which each defect was met in the forebears and the total number of times in other relatives; also whether the heredity was direct or collateral. In seventy of the ninety-six cases, or 73%, the heredity was direct, in the remaining twenty-six cases collateral; in twenty-five of this latter group the mental defect was either epilepsy or alcohol.

Table IV.—Ninety-six Cases of Epilepsy Showing But One of Five Defects in Ancestry.

	Mother.	Father.	Parents.	Mat. G. Mother.	Mat. G. Father.	Pat. G. Mother.	Pat. G. Father	Total Cases Direct Heredity.	Total Cases Collateral Heredity.	Total Cases. Direct Collateral.
Epilepsy	7	9	2	3	1	2	4	28	16	44
Alcohol	3	15	2	0	1	0	2	23	0	23
Insanity	3	3	1	0	1	0	0	8	9	17
Migraine	6	2	0	0	0	0	1	9	0	9
Feeble-mindedness	2	0	0	0	0	0	0	2	1	3

By referring again to Table II it will be noted that there were forty-seven cases showing two mental defects in the family history and that they were divided into nine distinct groupings. Epilepsy was combined with each of the other four factors in a total of thirty cases (64% of the group). Epilepsy plus alcohol, and epilepsy plus migraine were the two most common combinations; into these two groups fell twenty-one of the thirty cases. Mother epileptic and father alcoholic, or grandparent migrainous and mother epileptic are two groupings which are most frequently met.

There are still two other groups to be mentioned in passing, the first containing twelve cases and manifesting three defects in the family history, the other group consisting of only two cases and presenting *four* out of the possible five defects.

Table V gives these fourteen cases in detail and it will be observed that in several cases the same relative has more than one defect, as—mother epileptic and migrainous, father insane and alcoholic. This was true in only a few of the other cases.

From the above table it will be noted that epilepsy as a defective factor occurred in the entire fourteen cases, alcohol in nine cases, insanity and feeblemindedness in eight cases, and migraine in five cases.

The preceding tables, with the explanatory notes, show in a general way the distribution of the five genetic factors and the frequency with which each one was met, alone and in combination.

I would call your attention to twenty-one cases where one of the grandparents was epileptic. In this group we have the histories of three consecutive generations to study. The first (grandparents) and the third (patient) we know to be epileptic, while the second genera-

Table V.—Cases Showing More Than Two Hereditary Defects in Ancestry.

No.	Case.	Sex.	Age at Onset	Epilepsy.	Alcohol.	Migraine.	Feeble-mindedness.	Insanity.
3	1976	F.	41 yrs.	Uncle Cousin	Father			Father
5	1921	F.	?	Uncle	P. G. Father			P. G. Father
13	1651	F.	10 yrs.	Sister	Father			Cousin
14	1652	F.	12 yrs.	Sister.	Father			Cousin
140	2626	F.	2 yrs.	Mother	Father			M. Uncle
11	1562	M.	1. yr.	Brother Sister			Mother Father	M. G. Mother P. G. Father
10	784	F.	7 yrs.	Brother Sister			Mother Father	M. G. Mother P. G. Father
133	2700	M.	41 yrs.	Uncle.			Father	P. G. Mother
9	682	F.	1 yr.	Brother M. G. Mother		Mother	Uncle	
80	2232	M.	3 mos.	Cousin		Mother	P. Uncles	
107	2402	F.	2 yrs.	Brother	Father		Mother	
97	2115	M.	26 yrs.	Brother	Father	Father		
121	2824	F.	9 yrs.	Mother M. G. Mother	Father	Mother	Mother Father.	
147	2684	M.	14 yrs.	P. G. Mother	Father	Mother	M. Uncle Brother	

tion (representing the parents of patient) gave the following history: In seven cases the epilepsy continued through the three generations; in three instances it was replaced by migraine in the second generation only to make its appearance in its old form in the patient; in the remaining eleven cases there was nothing unusual noted with reference to the mental instability of the individual. This latter group forms a very interesting series of cases inasmuch as each case represented the offspring of an epileptic parent and the parent of an epileptic offspring, yet was without any mental symptoms.

This is a representative group of recessive epilepsy showing that defective germ-plasm may lie dormant for a generation awaiting some environmental condition to bring it to the surface.

In reviewing the literature on the subject of epilepsy and heredity I found that the age of the onset and its relation to the defects which were inherited from the forebears received but little attention. Donald Gregg of Brookline, Mass., read an excellent contribution to the subject of the potency of hereditary factors before the Section on Nervous and Mental Diseases at the meeting of the American Medical Association, June, 1914, the article appearing in the *Journal of the American Medical Association*, November 28, 1914. In his second conclusion he states, "If the age at which symptoms occur among psychoneurotic individuals may be considered an index of the potency of the essential factor at work," etc. Gregg apparently felt some hesitency in stating that there was a definite relation between the onset age and the potency of the genetic factor. I also wish to be cautious about drawing conclusions that are too dogmatic, for it will doubtless be necessary to make numerous alterations in our present data and study a vast amount more material before any definite conclusions can be drawn from a subject so broad.

I have computed, under several of the different divisions into which I have divided this series, the age at which the epilepsy was first noted. (That usually means the age of the first convulsion).

The first group considered was that made up of the ninety-six cases showing but one of the five hereditary defects.

HEREDITARY FACTOR.

	Average Age at Onset.
Feeblemindedness	6.2 years
Migraine	8.5 "
Epilepsy	11.1 "
Alcohol	13.7 "
Insanity	16.0 "

From this same group the average age at onset of the epilepsy was determined with reference to which one of the parents, or whether both had the defect, but without regard to what the defect might be.

ANY ONE OF THE FIVE DEFECTS.

	Average Age at Onset.
Mother	9.8 years
Father	12.1 "
Both parents	5.0 "

The next computation takes into consideration the number of defects inherited by the patient (Table II) and concludes the entire series.

NUMBER OF DEFECTS.

	Average Age at Onset.
One defect	11.1 years
Two defects	11.3 "
Three defects	11.6 "
Four defects	6.5 "

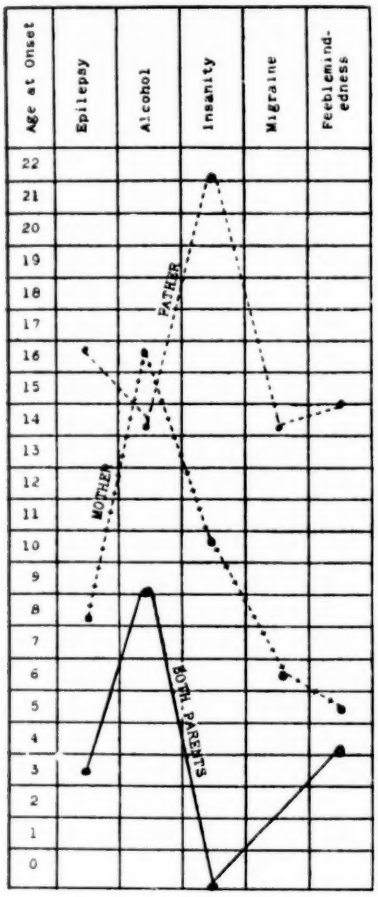
The age at onset with reference as to whether the heredity was direct or collateral was also computed, showing that those cases in the former class had an earlier onset than those in the latter.

Epilepsy	Direct	9.4 years
"	Collateral	13.0 "
Insanity	Direct	10.6 "
"	Collateral	14.6 "
Feeblemindedness	Direct	7.5 "
"	Collateral	16.0 "

The average age of the onset of the epilepsy when computed with reference to the hereditary factor alone fluctuated between 6.2 years for feeblemindedness to 16 years for insanity, while, when considered with reference as to which parent or whether both parents were defective, but with regard for the particular defect, the age at onset varied from 5 years where both parents were defective to 12.1 years where the father transmitted the defect.

I have constructed a chart to represent graphically the difference in the age of the onset of the epilepsy when both the defect and the parent possessing it are considered. The upper curve is the father's, the middle curve the mother's, and the lower curve represents the situation where both parents are defective. The outside vertical line indicates the onset age, while the five genetic factors are placed on the horizontal line above.

Granting for the present that the data so far submitted are inadequate to substantiate the theory that there is a definite relation between the age at onset of the epilepsy and the potency of the factor, but rather leads us to believe that the potency of the factor is dependent more upon its source, that is, whether maternal or paternal, and being decidedly more "virulent," if I may use the term, in those cases where both parents have the same defect, yet, I am still inclined to believe that between the age of onset and the hereditary factor there is a relation which depends, first, upon the potency of the factor, and second, upon the environmental conditions. How definite this relation may be one can say only after studying the cases sufficient in number and



SUMMARY OF TABLE VI.

AGE OF ONSET OF EPILEPSY IN OFFSPRING.

HEREDITARY FACTOR.	BOTH PARENTS.	MOTHER.	FATHER.
Epilepsy	3.5	8.2	16.8
Insanity	Congenital	10.6	22.0
Migraine	No cases	6.2	14.1
Feeblemindedness	4.0	5.3	15.0
Alcohol	9.0	16.6	14.1

detail from which conclusions may be drawn which are worthy of consideration.

I hardly feel justified in stating that conclusions of a definite nature have been drawn from this study; rather would I say, in closing, that the following suggestions have presented themselves from the above work. These conclusions or suggestions, as I prefer to call them for the present, are based upon the study of one hundred and fifty-seven cases from the Monson State Hospital, seventy-five females and eighty-two males, including practically all the hereditary cases of epilepsy which have been admitted to the hospital where complete family histories were available.

1. Epilepsy, alcohol, insanity, migraine and feeblemindedness are named in the order of the frequency with which each factor was met.

2. Named in the order of their potency in the production of an early onset of the epilepsy in the offspring, feeblemindedness came first, followed by migraine, epilepsy, alcohol, and insanity.

3. With the exception of alcoholism all the maternal defective factors were manifested in the offspring at an earlier date in the form of epilepsy than those factors transmitted by the father.

4. When both parents had the same defect the onset was at an earlier date than in those cases where only one parent was defective.

5. There was practically no difference between the average age at onset in those cases inheriting two or three defects and in those cases where the family history revealed but one.

6. Those cases with direct heredity averaged an earlier onset than those cases with collateral heredity.

7. The average age at onset in one hundred and fifty-seven cases with heredity was a little over eight years younger than two hundred and five cases computed without reference to heredity.

8. Thirty-nine percent of the entire group had more than one hereditary defect in the family history.

9. Eighty percent of the cases had direct heredity, and fifty-eight percent of the entire group gave a history of epilepsy in some member of the family.

10. Eleven cases, the offspring of epileptic parents and the parents of an epileptic offspring were free from mental defects themselves. I shall not discuss what I believe the errors to be in the above suggestions, some of them which are apparently obvious may prove, on further investigation, that they approach much nearer the actual conditions than we have heretofore believed.

STUDY OF A CASE OF EPIDEMIC TYPHUS FEVER IMPORTED INTO CENTRAL NEW YORK.

BY I. H. LEVY, M.D., SYRACUSE, N. Y.,

AND

J. L. KANTOR, M.D., SYRACUSE, N. Y.

On the evening of April 12, 1915, there was admitted to the Hospital of the Good Shepherd, Syracuse, a Macedonian immigrant, 42 years old, suffering from fever and a profuse rash. The next day he was transferred to the City Hospital, where we had the opportunity of following him to convalescence. According to the history subsequently obtained, he had but recently arrived in this country, had been well until April 7, when he began to experience malaise and loss of appetite. Two days later (April 9) he suddenly came down with a chill, severe headache, fever, and a dry cough. There was no expectoration or vomiting, and no rash was observed by the patient or his friends. On his admission to the hospital on the fourth day of his illness, he complained of frontal headache and of myalgic pains, especially in both thighs. There was no pediculosis capitis, pubis, or vestimenti.

Physical examination revealed the following:—

The patient was a well built, very dark skinned, middle-aged man, and appeared rather severely prostrated. He understood but little English, and even when spoken to in his own language (Bulgarian) seemed inattentive and confused. He was observed

to scowl occasionally and to put his hand to his head. The conjunctivae were markedly suffused and presented distinct petechial extravasations, five in the right, and one in the left lower fold. Photophobia, however, was not present. The pupils were contracted but otherwise normal. The tongue was thick, glazed, and fissured; the teeth were covered with sordes; the throat was dry and red. There was marked hypersensitiveness at Libman's test point (styloid process). The neck was held rather rigid, apparently to prevent movements of the head. At any rate there were no unequivocal signs of meningeal irritation—no tache, Kernig, Brudgzinski, or Babinski. The knee-jerks were not elicited.

The patient coughed occasionally without bringing up sputum. The respirations were accelerated (34 to the minute) but save for some scattered rhonchi, the lungs were negative. The heart borders were normal, the action rapid, and the sounds of poor quality; no murmurs were audible. The pulse was full and dicrotic. The sharp edge of the spleen could be felt 3 c.m. below the costal margin.

The skin showed a remarkably profuse, blotchy, eruption, universally distributed except on the face and genitals. The rash was distinctly visible on the dorsum of the hands and feet; it was most marked on the shoulders and abdomen. The lesions consisted of dirty pink macules and purplish petechiae, with indistinct borders fading irregularly into the surrounding skin. Especially common was a large macule with a petechial center. There was no herpes.

Course. The patient gradually became more prostrated and delirious. He mumbled to himself and on several occasions tried to get out of bed. There was involuntary urination and defecation. The pulse increased in rate, reaching 132 on the 15th of April. The cough became more frequent and moist râles developed at both bases; the respiration reached 44 on April 16, when the patient developed a transient hoarseness. At this point the rash began to fade perceptibly. The next day he seemed brighter.

On April 18 (tenth day of the disease), the temperature, which had heretofore remained practically constant between 103.6 and 104, and which had not responded to sponging, suddenly fell to 100.2. It rose in the afternoon, vacillated somewhat the next

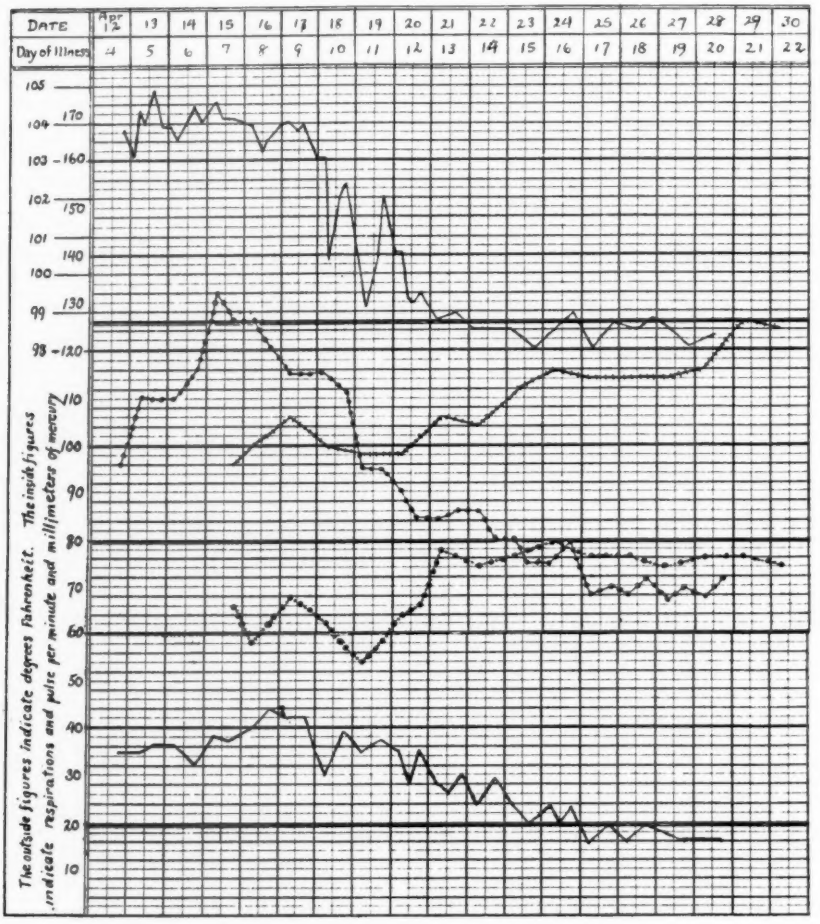


FIG. 1.

Temperature, Pulse, Respirations, and Blood Pressure in a Case of Typhus Fever.

The above is a modified Janeway blood-pressure and pulse chart. The uppermost (solid) curve represents the temperature, the second (dotted) curve the pulse, the third (cross-hatched) curve the systolic pressure, the fourth (dotted and cross hatched) curve the diastolic pressure, and the lowermost (solid) curve the respirations. The uppermost heavy horizontal line (at "126") represents the "normal" temperature and systolic blood-pressure, the middle heavy horizontal line (at "80") gives the "normal" pulse rate and diastolic blood-pressure, whereas the lowermost heavy horizontal line (at "20") indicates the "normal" respiration rate.

two days, and then remained at normal. On the first day of defervescence the patient was put on stimulation (whisky and digitalis), which was continued for four days. Even before the drop in temperature the pulse became perceptibly slower. On the 19th, irregularities due to premature contractions were observed; on the 24th, dicrotism could no longer be made out; and on the 25th, the premature contractions ceased. The following day the lungs were found clear of râles. On April 30, the day of his discharge, a short systolic murmur was heard at the apex for the first time. The spleen was still palpable just below the costal margin, the skin showed a few fading spots (there was no desquamation), the eyes were clear.

CLINICAL OBSERVATIONS.

Blood Pressure. Although it is well known that typhus, like typhoid, is a low blood-pressure disease, studies of this feature have apparently not been recorded in the literature. A chart of the systolic and diastolic blood pressure in our case is presented herewith (Fig. 1). The observations were made with a "Tycos" instrument at 10 o'clock each morning. The diastolic readings were taken by the auscultatory method. A study of the chart seems to bring out the following points:—

(1) The diastolic blood pressure varied directly with the temperature and pulse rate, and appeared to be a more accurate guide to the general condition of the patient than the systolic pressure. The lowest diastolic reading (54) was obtained on the eleventh day, in the midst of the "crisis" and at a time when the heart first showed signs of weakness. The diastolic pressure reached "normal" on the first day of defervescence. (2) The lowest pulse pressure was recorded on the first day of defervescence. (3) The systolic pressure rose relatively slowly after the crisis and did not reach "normal" until the ninth day of defervescence.

If we regard the diastolic pressure as "an indicator of the amount of peripheral resistance present in the arterial system" and the systolic as "an indicator of the force of the ventricular contraction of the heart" (Nicholson[1]), the conclusion is suggested that the restoration of normal arterial tone is one of the immediate accompaniments of crisis—as is the resumption of normal temperature and pulse rate—whereas the full heart power is completely recuperated only at a distinctly later period. Of course further studies of this point should be made before definite conclusions are drawn.

The Blood Picture. Rabinowitsch[2] was apparently the first to point out that in the early stages of typhus there is an increase in the large mononuclear cells (similar to the "irritation forms" of Türk) and that these cells disappear from the circulating blood just before the crisis. He observed this phenomenon in 98 of 125 cases. Wilder[3] mentions that an increase in the large mononuclears is an invariable accompaniment of experimental typhus in monkeys. The observations in our case seem to be in accord with these findings. The examinations were made each morning at ten o'clock, and from 200 to 400 cells were counted at each sitting. As indicated in the accompanying table (Fig. 2), the large mononuclears appeared in excess during the height of the disease, disappeared on the day preceding the "crisis," showed a transient rise on the last day of the "crisis,"* and then dropped to normal limits during convalescence. This peculiar behavior of the leucocytes seems to be a fourth specific phenomenon associated with defervescence in typhus fever. The total number of white cells did not reach normal until the fourth day of normal temperature.

Hemoglobin estimations, made on the twelfth, thirteenth, and fourteenth days, varied between 90 and 95% (Sahli). The red cells at that time ran between 4,200,000 and 4,550,000. Unfortunately, no erythrocyte counts were made during

* The term "crisis" refers to the entire period of rapid defervescence.

FIG. 2.—LEUCOCYTE COUNTS IN A CASE OF TYPHUS FEVER.

Date.	Day of Illness.	W. B. C.	% Polys.	% S. L.	% L. L.	% L. M.	% E.	% B.
April 13	4	13,500	77	4	7	12		
" 14	5	No count	—	—	—	—		
" 15	6	11,500	78	3	14	5		
" 16	7	13,500	81	4	9	6		
" 17	8	13,400	74	6	15	4.5	0.5	
" 18	9	13,700	82	4	13	1		
" 19*	10	11,000	80.5	4	15	0	0.5	
" 20*	11	10,000	70	4	18	7		1
" 21*	12	9,000	71	3.5	22.5	2.5	0.5	
" 22	13	9,000	61	7	32			
" 23	14	8,000	61	6	32	1		
" 24	15	6,500	73	6	19	2		
" 25	16	6,000	65	7.5	25	1	1	0.5
" 26	17	5,600	68	4	27	0	0	1
" 27	18	6,600	67.5	9.25	21.75	1.75	0	0.25
" 28	19	5,100	58	19.5	22	0		0.5
" 29	20	——	67.75	8.25				
" 30	21	——	59	6.5	33	0.5	0.5	0.5

* Days of crisis.
W. B. C. = white blood cells.
Polys. = polymorphonuclear neutrophiles.
S. L. = small lymphocytes.
L. L. = large lymphocytes.
L. M. = Large mononuclears.
E. = eosinophiles.
B. = basophiles.

the acute period of the disease, but appreciable anemia was certainly never present. In view of the above findings, it is hard to accept Rabinowitsch's belief that the poison of typhus fever is essentially hemolytic in nature.

The Urine. This is said to be diminished in amount and increased in specific gravity except just before the crisis, when many authors describe a transient diuresis as a not uncommon occurrence (Murchison,[4] Curschmann[5]). Our patient voided freely throughout the entire illness, and although complete twenty-four hour specimens were not always obtained, it is safe to estimate the average daily excretion at from one and a half to two liters. The specific gravity varied between 1005 and 1015. The fluid intake was forced from the beginning.

There was a rather marked febrile albuminuria and cylindruria, and even a month after defervescence a few hyaline casts and a trace of albumen were demonstrable. Our records showed an apparent increase in acidity (to phenolphthalein) and in specific gravity, beginning the day before the crisis and continuing a week after defervescence. Unfortunately we were unable to follow the urea excretion during the illness. This is especially to be regretted as there is serious disagreement as to its behavior in typhus. Thus the older writers (cited by Murchison) speak of a decided increase in the urea output, whereas Curschmann insists that this is not often the case and that the excretion is even diminished. A retention of chlorides is constant.

In our case the diazo was positive as long as the fever lasted. Tests for bile, sugar, acetone, and diacetic acid were constantly negative. Rabinowitsch[6] found urobilin increased in 74% of his cases. The test, performed according to his directions, was repeatedly negative in our hands.

Complement-fixation and *agglutination tests* have been used of late in the study of typhus fever. In the series of cases forming the basis of the recent important contribution of Plotz, Olitsky and Baehr,[7] 71.8 per cent. gave a positive complement-fixation test, and 92.1 per cent. gave a positive agglutination test in the post-critical stage of the disease. In our case the former reaction was negative, but the latter was strongly positive (1:1800).

We wish to express our thanks to Dr. Plotz for his studies on the blood-serum of our case; also to Dr. F. W. Sears, Health Officer of Syracuse; and to Dr. F. C. Burrows, physician to the City Hospital, for their courtesy in turning the case over to us for study.

REFERENCES.

[1] Nicholson, P.: The Clinical Significance of Diastolic and Pulse Pressure, Amer. Jour. Med. Sci., 1914, Vol. cxlii, p. 514.
[2] Rabinowitsch, M.: Hämatologische Diagnose des Flecktyphus, Deutsches med. Woch., 1913, Vol. xxxix, p. 2199.
[3] Wilder R. M.: The Problem of Transmission in Typhus Fever, Jour. Infect. Dis., 1911, Vol. ix, p. 9.
[4] Murchison, C.: A Treatise on the Continued Fevers of Great Britain, London, 1862.
[5] Curschmann, H.: Article, Typhus Fever, in Nothnagel, Encyclopedia of Practical Medicine, translated by Stengel. Philadelphia, 1901.
[6] Rabinowitsch, M.: Urobilin u. Diazoreaktion beim Flecktyphus, Berl. klin. Woch., 1914, Vol. li, p. 1456.
[7] Plotz, H., Olitsky, P. K., and Baehr, G.: The Etiology of Typhus Exanthematicus, Jour. Infect. Dis., 1915, Vol. xvii, p. 1.

BLOOD-PRESSURE.

By Cadis Phipps, M.D., Boston.

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A list of figures denoting the blood-pressure determined in different parts of the body would at first thought seem uninteresting. However, when we stop to consider the importance placed upon an individual's blood pressure in regard to diagnosis, prognosis, and treatment, and the narrow limits observed in examination for life insurance (120 mm. to 140 mm. for a man and 110 mm. to 130 mm. for a woman), it is of value to know how great may be the variations in the same individual.

In brief, blood-pressure depends upon the energy of the heart, the peripheral resistance, and, to a lesser degree, the volume of blood. That a certain minimum pressure (diastolic) is maintained depends upon this peripheral resistance of arterioles and capillaries and also the elasticity of the vessel walls. Friction also plays a part,—not so much friction of the blood with vessel walls, for the blood directly in contact with them is almost stationary, but rather the friction within the circulating fluid itself which, of course, varies directly with the viscosity. (Poiseuille[1] has formulated a law explaining this).

However, there arises the question of what factors may enter into the production of blood-pressure as we ordinarily determine it, and if these conditions, unless recognized, may not be a source of error. There are certain physiological variations such as those caused by posture, emotion, digestion, exercise, etc.

For example, we know that blood-pressure becomes higher upon a patient's arising from a recumbent position. If, however, the individual is markedly fatigued, the pressure may fall 10 or 20 mm. It has also been noted that "neurasthenics" show this fall instead of the expected rise.

Emotion may raise the blood-pressure. Probably many of us have noticed that a blood-pressure which we have taken previously will have risen 20 or even 30 mm. when determined in the presence of a class of students, and the same individual's blood-pressure will return to the first height observed shortly after the excitement of the clinic has passed.

Being curious to determine if possible whether or not the location of the artery upon which pressure is applied and the thickness of the over-

[1] Berlin. klin. Woch., 1912, p. 773.

	Sex.	Age.	Right. Arm. Palp.	Arm. Ausc.	Thigh.	Calf.	Left. Arm. Palp.	Arm. Ausc.	Thigh.	Calf.
1. Cancer of liver, slight atheroma	M.	80	150	145	162	168	150	145	143	140
2. Acute bronchitis, moderate atheroma	M.	65	118	118	130	135	118	118	125	130
3. Acute art. rheumatism	M.	56	125	120	—	—	125	120	130	140
4. Chronic alcoholism	F.	36	130	125	140	143	130	125	162	132
5. Chorea	F.	16	110	115	120	100	102	102	—	—
6. Subacute appendicitis	M.	27	118	115	140	120	110	110	140	122
7. Lobar pneumonia	M.	28	140	140	124	140	140	140	188	140
8. Lobar pneumonia	M.	36	120	120	115	125	120	120	140	132
9. Acute art. rheum., mitral regurg.	M.	22	115	120	148	142	110	115	142	162
10. Acute art. rheum.	M.	37	118	118	140	105	118	118	115	120
11. Acute art. rheum., mitral regurg.	M.	19	140	140	170	130	130	130	142	170
12. Alcoholic cirrhosis of liver	F.	44	150	150	160	120	120	120	160	120
13. Marked atheroma, lobar pneumonia	F.	76	180	180	186	180	180	180	180	182
14. Lobar pneumonia	F.	29	105	105	146	146	105	110	120	116
15. Gen. paresis, slight atheroma	M.	45	150	145	160	140	150	150	170	150
16. Chronic alcoholism	M.	39	140	135	195	160	140	135	160	140
17. Constipation	F.	19	125	120	122	126	115	115	140	108
18. Hypertrophied heart, lobar pneumonia	M.	37	110	110	130	118	115	115	120	102
19. Pulmonary tuberculosis	M.	29	120	117	—	—	118	118	—	—
20. Pulmonary tuberculosis	M.	36	124	122	—	—	120	120	138	142
21. Pregnancy (7 mon.) mitral regurg.	F.	27	100	105	125	115	105	105	118	115
22. Mitral regurg.	M.	23	130	130	170	135	140	140	158	155
23. Acute follic. tonsillitis	F.	24	120	125	135	125	115	115	145	130
24. Chronic alcoholism, pregnancy (4 mon.)	F.	39	115	125	140	123	112	115	156	143
25. Vertigo—otitis media	M.	20	125	120	122	115	125	120	145	135
26. Aortic stenosis and regurg.	M.	13	110	110	152	160	115	110	146	158
27. Mitral regurg.	M.	15	130	125	160	185	136	135	170	198
28. Erysipelas, moderate atheroma	F.	61	158	150	185	170	150	145	178	170
29. Lobar pneumonia	M.	17	115	120	142	116	115	120	142	122
30. Slight atheroma, cancer of sigmoid	F.	50	95	100	124	104	95	100	132	110
31. Acute artic. rheum.	F.	40	90	95	120	98	90	95	120	98
32. Acute gastritis	M.	35	138	138	150	120	138	138	160	154
33. Cerebral haem. (trauma)	M.	29	140	140	190	130	140	140	122	160
34. Mitral regurg., pericardial effusion	M.	31	140	152	192	170	150	140	175	150
35. Acute artic. rheum., moderate atheroma	M.	56	120	110	148	115	132	125	175	135
36. Aortic aneurysm	M.	29	105	105	140	145	125	122	165	160

(With the exception of Cases 1, 2, 12, 15, 26, 30, and 33 the acute symptoms had disappeared and the patients were ready for discharge.)

lying tissues might influence the readings, I have tried fastening the cuff about each arm (our usual method) and also about each thigh and calf, determining the pressure in these latter instances by the cessation of the pulsation in the Dorsalis Pedis artery. I have used a "Tycos" sphygmomanometer, verifying the results frequently with a mercury manometer, both of them having a rubber cuff 12 cm. in width. My usual method was to have one of my house-physicians take the reading at a signal from me, repeating this until I had three practically identical readings, or else to take the pressure himself and compare his findings with mine afterward. In this way I hoped to avoid personal error. In each instance the patient was recumbent. I avoided cases having such local conditions as injury to the extremities, oedema, etc., which might prove a source of error, but on the other hand I have been quite uninfluenced by blood-pressure findings, in my selection, having included, for the sake of completeness, three cases in which I was unable to palpate the Dorsalis Pedis artery in one foot and one case where I could not feel it in either.

CASES.

Of the thirty-six cases observed, there was only one (No. 13) in which the pressure was everywhere practically the same.

In thirty-three instances there was a difference of 5 mm. or more in the brachial pressure as determined by palpation compared with the auscultatory reading, eighteen readings showing a higher pressure by palpation and fifteen the contrary. In four cases the variation was as great as 10 mm.

The right and left arms showed a difference in pressure, apparently, of 10 mm. or more in 20% of the cases, with no tendency for it to be uniformly higher in either arm. It is of particular interest to note here that in Case No. 36 (aortic aneurysm, verified by x-ray) the difference in pressure was 20 mm., whereas in Case No. 12 (cirrhosis of the liver with no pathological condition of the heart and only slight arterio-sclerosis, as shown by autopsy), the variation was 30 mm.

The variations between pressures obtained by applying the cuff on the arms, thighs, and calves, and between the right and left thighs, and the right and left calves, were even more marked. The results are almost impossible to classify as the variations range from 5 or 10 mm. to over 60 mm. In general, it may be said that the pressures obtained in the arms are lower than those obtained in the thighs or calves, although in Case No. 12 the pressure in the arm was 30 mm. higher than that obtained in the calf.

To get further evidence of the influence on the blood-pressure reading of the tissues overlying the artery, I placed a strip of fatty meat, about 10 cm. wide and 2 cm. in thickness, loosely about the arm under the cuff on two normal young adults. It caused no variation from the reading which I obtained on the bare arm. Placing a small roll of meat along the edge of the biceps gave me a reading of about 10 mm. lower. The same results were obtained by using folds of gauze.

During these observations I have noticed, furthermore, that if the patient raised his head the pressure rose 5 to 10 mm. A single vigorous cough made the needle fluctuate 10 to 20 points upward, and, what was more interesting to me, even cases where the patient's pressure was as low as 130 mm., if the pressure in the cuff were increased to even 200 mm., a vigorous cough would cause the needle to move and also a distinctly audible and palpable pulse-beat would be transmitted.

SUMMARY.

1. A difference of 5 or 10 mm. in the blood-pressure reading may be observed, dependent on whether the pressure be determined by palpation or auscultation, but neither method can be said to be the more accurate.

2. The blood-pressure reading may vary in the same individual between the right and the left arms, thighs, or calves, or between arm and thigh and calf; this variation is in no way uniform.

3. The variations are apparently as great in young individuals as in old, and in cases showing healthy arterial walls as where there is arterio-sclerosis.

4. The location of the artery, especially in its relation to other structures such as bone and muscle, probably is of much greater importance in determining the blood-pressure reading than is thickness of the overlying tissues.

5. Difference between the right and left brachial pressures is by no means diagnostic of aortic aneurysm.

6. The presence of a higher pressure in the leg than in the arm is not diagnostic of aortic insufficiency, although this has been stated by previous observers. (Leonard Hill, "Heart," 1910, i, p. 73, and Humphrey Rolleston, "Heart," 1912, iv, p. 83).

7. Blood-pressure in the vessels of the leg and arm is *not* "practically the same ("Blood-Pressure," Edward H. Goodman, 1914, p. 89) in normal individuals."

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SAMUEL JOHNSON AND DR. THOMAS LAWRENCE.

Of the various physicians with whom Samuel Johnson at various times of his life came into contact there was none with whom his friendship was more intimate than with Dr. Thomas Lawrence, whose name appears frequently in Johnson's correspondence and in the pages of Boswell. Dr. Lawrence was not only one of the most eminent physicians of his time but was a man of culture, a profound Latin scholar, and gifted with a degree of literary taste and insight which made it possible for Johnson to meet him upon more than a professional basis.

It is interesting that this Dr. Lawrence was a descendant of the Lawrence who was an intimate friend of John Milton, and to whom the later addressed his famous tenth sonnet beginning,

"Lawrence, of virtuous father virtuous son."

This virtuous father was Henry Lawrence, member for Herefordshire in the Little Parliament of 1653; president of Oliver Cromwell's council; high in favor with Richard Cromwell; and author of "Our Communion and War with Angels" (published in 1646). Of the virtuous son, Milton's friend, little is known.

Dr. Thomas Lawrence, their descendant, was born in 1721. The essential facts of his life are to be found in dictionaries of medical biography. His first acquaintance with Johnson seems to have begun about 1754; for in a memorandum of that date Johnson mentions him among a list of forty persons whom he visited. The correspondence between the two, however, forming our chief knowledge of their relations, did not begin until some years later. In 1758 Johnson mentions Dr. Lawrence in a letter to Mr. Langton; and again in one of his letters to Mrs. Thrale he refers to Lawrence as saying that medical treatises should always be in Latin. Lawrence's letters to Johnson were written in that language. Finally under date of February 7, 1775, appears Johnson's first letter to "the learned and worthy Dr. Lawrence whom Dr. Johnson respected and loved as his physician and friend."

"Sir:—One of the Scotch physicians is now prosecuting a corporation that in some public instrument have styled him *doctor of medicine* instead of *physician*. Boswell desires, being advocate for the corporation, to know whether *doctor of medicine* is not a legitimate title, and whether it may be considered as a disadvantageous distinction. I am to write to night; be pleased to tell me. I am, Sir, your most, etc.,

"Sam. Johnson."

As time went on, Johnson's regard for Lawrence evidently increased. In one of his conversations in 1776 he said, "My knowledge of physic I learnt from Dr. James, whom I helped in writing the proposals for his dictionary, and also a little in the dictionary itself. I also learnt from Dr. Lawrence, but was then grown more stubborn." In January, 1777, Johnson first consulted Dr. Lawrence professionally. He had been suffering for some days from dyspnea and says in a letter to Mrs. Thrale under date of January 15, "I found it now time to do something, and went to Dr. Lawrence, and told him I would do what he should order without reading the prescription. He sent for a chirurgeon and took about twelve ounces of blood, and in the afternoon I got sleep in a chair.

"At night, when I came to lie down, after trial of an hour or two, I found sleep impracti-

cable, and therefore did what the doctor permitted in a case of distress. I rose, and opening the orifice, let out ten ounces more. Frank and I were awkward; but with Mr. Levett's help, we stopped the stream, and I lay down again, though to little purpose; the difficulty of breathing allowed no rest. I slept again in the daytime in an erect posture. The doctor has ordered me a second bleeding, which I hope will set my breath at liberty. Last night I could lie but a little at a time."

As years progressed Johnson's health grew steadily worse and the references to it in his letters became more and more frequent. His own sufferings, however, did not prevent him from sympathizing with those of his friends. In a letter to Lawrence under date of January 20, 1780, he begins with an account of his own illness: "I have been hindered by a vexatious and incessant cough, for which within these ten days I have been bled once, fasted four times, taken physic five times, and opiates, I think, six. This day it seems to remit." Following this, however, he proceeds with a most feeling and sympathetic address to his friend upon the recent loss of the latter's wife.

In a letter from London to Mrs. Porter, under date of April 8, 1780, Johnson says, "I have lately had colds; the first was pretty bad, with a very troublesome and frequent cough; but by bleeding and physic it was sent away. I have a cold now but not bad enough for bleeding." Bleeding and physic were the panaceas of the age. It is small wonder that people dreaded to visit the physician almost as much as the surgeon,—a dread whose inheritance is probably responsible for the failure of timely consultation even in the present day. In spite of all, Johnson's health seems even to have improved during the succeeding months, and on June 18, he says, "In the morning of this day I perceived a remission of those convulsions in my breast which had distressed me for more than twenty years." Lawrence himself was failing at this time and had grown exceedingly deaf, an infirmity to which Johnson makes reference in various letters to others. On March 19, 1782, Johnson wrote in his Prayers and Meditations, "Poor Lawrence has almost lost the sense of hearing: and I have lost the conversation of a learned, intelligent, and communicative companion, and a friend whom long familiarity has much endeared. Lawrence is one of the best men whom I have known." Croker quotes a rather pathetic incident of a conversation between the two, struggling with their respective infirmities. Dr. Johnson was exceedingly ill and Mrs. Thrale accompanied him to consult Dr. Lawrence at the latter's office on Essex street. "The physician was, however, in some respects more to be pitied than the patient. Johnson was panting under asthma and dropsy; but Lawrence had been brought home that very morning struck with a palsy from which he had strove to awaken himself by blisters: they were both deaf and scarce able to speak, one from difficulty of breathing, the other from paralytic debility. To give and receive medical counsel, therefore, they sat down on each side of a table in the doctor's gloomy apartment, adorned with skeletons, and wrote questions and answers to each other in Latin." In May, 1782, Johnson again sent to Lawrence a brief Latin note descriptive of his symptoms:

"Maiis Calendis, 1782.

"Novum frigus, nova tussis, nova spirandi difficultas, novam sanguinis missionem suadent, quam tamen te inconsulto nolim fieri. Ad te venire vix possum, nec est cur ad me venias. Licere vel non licere uno verbo dicendum est; caetera mihi et Holdero* reliqueris. Si per te licet, imperatur nuncio Holderum ad me deducere. Postquàm tu discesseris quò me vertam?"

Though Dr. Lawrence made slight recovery from his paralytic shock, his health continued steadily to fail and he died on June 13, 1783. His son, the Rev. John Lawrence, died two days later. It was upon an earlier illness of this son that Johnson had written his Latin ode, "Ad Thomam Lawrence," (I, 180). On June 17, Johnson writes in a letter to Taylor, "It has pleased God, by a paralytic stroke in the night, to deprive me of speech. I am very desirous of Dr. Heberden's assistance, as I think my case is not past remedy." Later in a letter to Mrs. Thrale he refers feelingly to the death of Lawrence. Apparently for a year or two, on account of Lawrence's failing health, he had begun to depend medically upon Dr. Heberden and Dr. Pepys.

The story of Johnson's last illness and of his death, on December 13, 1784, is written at length in the pages of Boswell. It is interesting to know that there has recently been brought to this country a collection of eleven of the autograph letters of Johnson to Lawrence, as well as the original manuscript of the Latin ode. Only one of these letters, that quoted above, is included in Boswell's Life. The remaining ten

* Johnson's apothecary in the Strand.

are still unpublished and eight of them deal with Johnson's state of health.

The relations of great men, whether men of letters or of affairs, with their physicians are, perhaps, no different in kind from those of more ordinary patients; yet they seem often to acquire, especially for members of the profession, a peculiar interest dependent not only upon the distinction of the patient, but upon the character of his consultant and adviser as well. Dr. Lawrence was a man of as great distinction in his own profession, and as truly a representative of the age, as was Johnson himself; and the record of their association, both social and professional, during so many years, has fortunately persisted through their letters and through the diligence of Boswell, their common biographer.

HAVELOCK ELLIS AND BIRTH CONTROL.

In the September issue of *Physical Culture*, Mr. Havelock Ellis, the distinguished British sociologist and scientific writer on eugenic subjects, presents the first of a projected series of three articles on birth control. It is probably ill to differ with one of his world-recognized authority, yet there seem certain points in which, perhaps, at least in this preliminary article, he errs in his interpretation of admitted facts.

The burden of Mr. Ellis's contention appears to be that because lower forms of life, like the herring, are profusely prolific, whereas higher forms, like the elephant, reproduce themselves very slowly, therefore to reduce the birth-rate in man is to improve the type and accelerate evolution. As evidence of this he adduces Spencer's theory of the function of sex in evolution, which Prof. Coulter has expressed as "reproduction under peculiar difficulties."

....."The object of sex is by no means to aid reproduction, but, rather, to subordinate and check reproduction in order to evolve higher and more complex beings. Here we come to the great principle, which Herbert Spencer developed at length in his 'Principles of Biology,' that, as he put it, Individuation and Genesis vary inversely, whence it follows that advancing evolution must be accompanied by declining fertility. Individuation, which means complexity of structure, has advanced as Genesis, the unrestricted tendency to mere multiplication, has receded. This involves a vastly diminished number of offspring, but an immensely increased amount of time and care in the creation and breeding of each; it involves also that the reproductive life of the organism is shortened and more or less confined to special periods; it begins much later, and usually ends earlier, and even in its period of activity it tends to fall into cycles. Nature, we see, who at the outset had endowed her children so lavishly with the aptitude for multiplication, grown wiser now, expends her fertile imagination in devising preventive checks on reproduction for her children's use.

"The result is that though reproduction is greatly slackened, evolution is greatly accelerated. The significance of sex, as Coulter puts it, 'lies in the fact that it makes organic evolution more rapid and far more varied.' It is scarcely necessary to emphasize that a highly important, and, indeed, essential aspect of this greater individuation is a higher survival value. The more complex and better equipped creature can meet and subdue difficulties and dangers to which the more lowly organized creature that came before—produced wholesale in a way which Nature now seems to look back on as cheap and nasty—succumbed helplessly without an effort. The idea of economy begins to assert itself in the world. It became clear in the course of evolution that it is better to produce really good and highly efficient organisms, at whatever cost, than to be content with cheap production on a wholesale scale. They allowed greater developmental progress to be made, and they lasted better. Even before man began, it was proved in the animal world that the death-rate falls as the birth-rate falls."

These statements are doubtless all true, but the inference which Mr. Ellis seems to draw from them is that to reduce the birth-rate is necessarily to improve environment and increase the good quality of the stock.

....."To improve the environment is to check reproduction, being indeed the one and only fundamental way in which undue reproduction can be checked. That may be said to be an aspect of the opposition between Genesis and Individuation, on which Herbert Spencer insisted, for by improving the environment we necessarily improve the individual who is rooted in that environment. It is not, we must remember, a matter of conscious and voluntary action. That is clearly manifest by the fact that it occurs even among the most primitive micro-organisms: when placed under unfavorable conditions as to food and environment they tend to pass into a reproductive phase and by sporulation or otherwise begin to produce new individuals rapidly. It is the same in Man. Improve the environment and reproduction is checked. That is, as Professor Benjamin Moore has said, 'the simple biological reply to good economic conditions.' It is only among the poor, the ignorant and the wretched that reproduction flour-

ishes. Those who desire a high birth-rate are desiring, whether they know it or not, the increase of poverty, ignorance and wretchedness."

The question arises whether possibly Mr. Ellis may not have mistaken effect for cause. No doubt it is true that, within certain limits, birth-rate automatically adjusts itself to conditions; but is it equally true that, within limits, artificial control of birth-rate can regulate conditions? Very likely it can, so long as the race or species practising it does not come into collision with some inimical other race or form of life. But when this does occur, the factor of numbers may well become of decisive importance, and a more prolific, though in some other details inferior, type may outstrip its less fertile, more highly individualized rival. Indeed it seems that even Spencer may have failed to realize that, though individualization is one of the primary methods of evolution, it may be carried on too far and too rapidly and wreck itself by its own momentum. The highly developed type of civilization, which sacrifices the race to the individual, may conceivably be unable, for sheer lack of numbers, to cope with the type of civilization which is willing to sacrifice the individual for the race. It is neither numbers nor high individuation alone which counts, but a combination of the compossible maximum of each.

Life might be far simpler, were a single race of men occupying the world alone, yet this would be undesirable, since it would remove the essential element of conflict. In the long course of evolution, man has triumphed over other forms of life, until only the insects and bacteria remain an important menace. He has not done this, however, by reducing the birth-rate. To-day his chief foes remain they of his own household. The factors which lead to an artificial reduction of birth-rate constitute one of the chief sources of danger to any civilization in the face of another civilization in which these causes have not become so extensively operative.

CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA.

THE sixth annual session of the Clinical Congress of Surgeons of North America is to be held in Boston during the week beginning October 25, 1915, and in general will be conducted in the same manner as previous sessions. Following the precedent established at London in July, 1914, however, the number in attendance will be limited in accordance with the capacity of the clinics and operating rooms where demonstrations are to be held. A preliminary program for these clinics has already been announced at the leading hospitals of the city. Further details of this program and account of the sessions will appear in subsequent issues of the JOURNAL. The registration for the Boston session is nearly complete and special tickets are soon to be issued. The headquarters of the Congress will be at the Copley-Plaza Hotel.

A series of meetings has been arranged for the first four evenings of the week. At the meeting on Monday evening, October 25, the president elect, Dr. Charles H. Mayo, will deliver his annual address. On each of the three subsequent evenings there will be two meetings, one for the section on general surgery, the other for the section on surgical specialties. The principal papers at these meetings will be read by visiting surgeons and the discussion will be led by Boston surgeons.

It is recognized that the essential part of the meetings of this Congress is the clinical demonstrations, and it is intended that there shall be a complete representation of the clinical facilities of Boston and a demonstration of the work which is being done by its leading general surgeons and specialists. The JOURNAL is glad, through its columns, to extend the courtesy and welcome of the Boston profession to its guests. The success of the Congress will depend upon the energy and cordiality with which every member of that profession does his share in carrying out the careful and thorough plans which have been made by the committee of arrangements for this first meeting of the Clinical Congress of Surgeons of North America in Boston.

MEDICAL NOTES.

NEW YORK DEATH RATE INCREASES.—During the week ended September 11 there were 1355 deaths with a rate of 12.17 per 1,000 of population as compared with 1206 deaths and a rate of 11.27 for the corresponding week of last year. While there were 149 more deaths during the past week, the increase in population accounted for 49. The other 100 were due to increased mortality of certain diseases, particularly measles, scarlet fever, diphtheria, whooping

cough, lobar and bronchial pneumonia and pulmonary tuberculosis.

In spite of last week's jump in the death rate, the rate for the first 37 weeks of 1915 is only 13.54 as compared with 13.97 for the corresponding period of last year.

In view of the loss of population in the City of New York, occasioned by the European war, the Department of Health has felt the need of revising its estimates of the population and has been awaiting the result of the state census, but the Department does not as yet feel justified in accepting as a basis for its calculation, the figures published recently by authority of the Secretary of State. The Registrar has made an estimate of the population, giving weight to the various factors that have been reducing the population during the past year. The revised estimate of the population is 5,597,000. The rate for the past week, based on this revised population, is 12.63.

Typhoid Fever in Illinois.—During the month of August, 1200 cases of typhoid fever were reported in Illinois and at the usual rate it is expected that there will be 3500 cases by the end of September. Extensive anti-typhoid inoculation is advised by the Illinois Board of Health as a check against the spread of this epidemic. The value of such inoculation is already proved beyond question. During the year 1914, there were among the 93,000 troops of the United States only seven cases of typhoid fever. Of these patients four had not been inoculated. The three who had been inoculated had a very mild form of the disease. Of the four not inoculated, all had the disease severely and two died.

Prevalence of Meningitis, Poliomyelitis, Small-Pox and Typhoid.—The weekly report of the United States Public Health Service for September 3, 1915, notes that during the month of July there were reported 20 cases of cerebrospinal meningitis in New York, and 30 in Virginia. During the same period there were in New York 13 cases of poliomyelitis and 402 of typhoid; and in Virginia, 23 cases of poliomyelitis, 65 of small-pox and 620 of typhoid. There were 86 cases of small-pox in Kansas, 88 in Iowa and 141 in Indiana; and of typhoid there were 125 cases in California, 129 in Kansas, 149 in Indiana and 168 in Texas.

Decline in United States Immigration.—Report from Washington, D.C., on September 9 states that during the year ended June 30, 1915, only 326,700 immigrants came to this country, the lowest number since 1900. The total number of immigrants for the year ended June 30, 1914, was 1,218,480. This decline, which may presumably be attributed in great part to the European war, is regarded by some as an advantageous and by others as a disadvantageous phenomenon.

Care of the Teeth.—A recent study by Bunting and Rickert, members of a research commission of the National Dental Association on the causes of decay of teeth, contains some interesting information regarding the use of tooth powders and tooth pastes. Various proprietary cleaning preparations were tested as to their effect on the enamel of the teeth in conjunction with the action of the saliva. They state that most of the powders on the market are made of chalk, some contain oxide of tin, and pumice stone and cuttle fish form an ingredient of the more gritty pastes. In conclusion the authors state as follows:

"We feel that dentists should make a more close study of the properties of dentifrices which they are prescribing, and also the needs of the mouths in which they are to be used. In cases in which the saliva is viscous and deposits form upon the teeth with great rapidity, making it difficult to keep the mouth clean, then a more abrasive dentifrice might be used to advantage. But when the saliva is thin and the deposits few, an abrasive powder or paste is clearly not indicated. Rather should a fine and hydroscopic preparation be employed which will polish and clean the teeth without wear. The results which we have obtained serve also to call attention again to the importance of brushing the teeth in a vertical rather than a horizontal manner. Especially is this true in the case of sharp preparations, which would have produced no such pronounced results as seen in the experiment had they been brushed lengthwise of the teeth.

Public Health Work at Home and Abroad.—Two publications, one from Scotland and one from Pennsylvania, are full of timely suggestions and recommendations for more efficient public health work. The former is a communication by Dr. William Robertson, health officer of Leith, who, in considering present sanitary conditions of Scotland and England, states that first of all, housing should be bettered. There should not be the opportunity for the unreliable factor to run into another burrow when the one he is living in is demolished for improvements. The segregation of human beings in great masses, under utter lack of hygienic surroundings, cannot fail to be a very important factor in morbidity and mortality.

The public house is the second of the evils which Dr. Robertson would correct. He is not advocating prohibition, but the proper regulation of alcohol. He instances the Germans, from whom, despite public opinion just now, it is possible to learn much. The Germans are very far from abstainers, in fact their capacity for certain alcoholic drinks is a by-word and their consumption of them enormous, but the sensible regulation of drinking robs the public house of its iniquities. Proper legislation on drinks and drinking in England and Scotland would be a benefit to the public health.

Thirdly, in considering his question, Dr. Robertson pointed out the unreasoning nature of the class which he thinks should receive sanitary education in the public schools. After a strike a firm in Leith looked into the improvement in housing of its laborers, eight hundred in number. The increase in wages was 30 per cent, the number of laborers taking advantage of this to improve their housing was two. This is the character of the unthinking, unreasoning personal factor with which health authorities labor.

Dr. Dixon, the health commissioner of Pennsylvania, in a current issue of the publication, "Little Talks on Health," discusses the frequency with which typhoid is contracted by picnic parties who rely on convenient brooks and springs for their drinking water. He urges that vacationists in putting up their lunches for day's trips should always include bottles of drinking water. He urges campers to boil all water used for drinking purposes as well as to discover, if possible, the sources from which their water comes to them.

TUBERCULOSIS WEEK.—In a previous issue of the JOURNAL we have noted from time to time the annual observance of Tuberculosis Sunday. This year the National Association for the Study and Prevention of Tuberculosis has determined to extend this observance over an entire week which is announced for December 6 to 12. Each day of this week will be devoted to a special aspect of the work.

"Medical Examination Day is set for Wednesday, December 8, and will be the first effort on a national scale to urge an annual physical examination for everyone. Plans for the day include an appeal to induce everyone, sick and well, to see a doctor and learn whether they are in good physical condition. The scheme includes also the inauguration on the part of factories, stores and offices of an annual physical examination for all employees. Thousands of anti-tuberculosis associations, other societies and dispensaries all over the country are expected to coöperate in furnishing free examinations for those not able to pay a physician.

Children's Health Crusade Day on Friday, December 10, is planned to interest and instruct school children in healthful living. Special exercises will be held at which lectures, essays, and playlets will be given on the subject of health. This will also be the occasion for launching the Red Cross Christmas seal sale in the schools.

The culmination of the campaign will be the sixth annual celebration of Tuberculosis Sunday. Last year on Tuberculosis Day over 100,000 churches gave attention to the subject of tuberculosis by sermons, talks and announcements. The governors of all the states will be asked to issue proclamations calling attention to the importance of increasing the knowledge of the public on how to avoid consumption. Clubs, lodges and societies will also be asked to consider the subject at a meeting either on Tuberculosis Sunday or some other day of Tuberculosis Week."

A STUDY OF DIARRHEAL DISEASES AMONG NEW YORK BABIES.—The Bureau of Public Health and Hygiene of the New York Association for Improving the Condition of the Poor has issued a publication entitled "Flies and Diarrheal Disease." It contains a report of three months' study of over a thousand infants in New York on the relation of flies, dirt and artificial feeding and diarrheal diseases. Its conclusions are as follows:

"Almost twice as many infants (1.9) had diarrhea among fly-exposed as among fly-protected infants.

"The group of influences, associated with a dirty home, and designated as the 'dirt' factor, play a similar part in diarrheal incidence among infants. Almost twice as many infants (1.8) had diarrhea in dirty homes as in clean homes.

"Of somewhat greater importance is the influence of artificial feeding. Almost two and one-half times as many infants (2.4) were attacked by diarrhea among the artificially fed as among the breast fed infants. If the milk had not been selected and instruction in feeding given in many cases, this difference would have been still greater.

"The influence of flies and 'dirt' combined is of similar importance to that of artificial feeding. Almost two and a half times as many fly-exposed infants (2.4) in dirty homes were attacked by diarrhea as fly protected infants in clean homes.

"The influence of 'dirt' and artificial feeding combined is still greater. Three and a half times as many artificially fed infants (3.5) in dirty homes were attacked by diarrhea as breast fed infants in clean homes."

AMERICAN PUBLIC HEALTH ASSOCIATION.—At the meeting of the American Public Health Association held in Rochester, N. Y., Edward A. Moree, assistant secretary of the New York State Charities Aid Association, spoke at length on the important part that the daily press has played in promoting public health. In campaigns to reduce infant mortality, in the education of the public in matters of sanitation, milk supply and control of tuberculosis, he regarded the influence of the press as of paramount importance and advocated a campaign of purchased advertising on the evils of patent medicines.

The need for improving rural sanitation was strongly urged by Dr. W. S. Rankin, secretary of the North Carolina state board of health, who pointed out that the field of rural sanitation embraces more than 99% of the area of the United States and more than half of the country's population. He declared that the work of improving rural standards of sanitation should be initiated by the state governments and conducted by the local or county governments.

On September 9, a symposium was held on the death rate of the higher age groups. Dr. Elmer E. Rittenhouse, president of the Life Extension Institute stated that failure to observe the rules of hygiene had increased the death rate from diseases of heart, arteries and kidneys 100% in three decades.

Dr. E. L. Fisk, director of hygiene of the Life Extension Institute, recommended, for the prevention of these diseases, education in safeguarding the circulation and kidneys, and advice against over-strain, over-eating, taking of stimulants and lack of exercise.

Dr. J. F. Anderson, at the same symposium, made the statement that in only 41 cases out of 32,000,000 had vaccination resulted in tetanus.

On "Cancer and the Public Health," Dr. Francis Carter Wood, director of cancer research, Columbia University, declared that comparatively little is known about cancer and there are many problems for the elucidation of which further data are needed, the collection of which should begin at once.

Dr. H. W. Hill, medical health officer of London, Ont., said deaths from cancer were annually increasing, and if they continued would be as numerous by 1925 as those from tuberculosis.

J. Frank Chase of the New England Watch and Ward Society spoke on the suppression of the habit-forming drugs. He stated that there were two factors in the controlling this vice, the demand and the supply. The Harrison Bill attempts almost wholly to regulate the supply for the United States. If the demand is to be checked old victims must be cured and recruiting of new victims prevented. He therefore urges that, to accomplish this, drug users who are criminals should be segregated, and institutions created for the segregation of drug users who are not criminals, and thirdly, that more careful prescribing on the part of physicians be enforced by more stringent laws and the coöperation of medical societies. The standing committee on habit-forming drugs presented their report. Chief among the committee's recommendations is that a census be made of all habitual users of narcotic drugs; establishment by the states of custodial institutions for non-criminal drug users, and the enactment of laws for more efficient restriction of physicians in prescribing drugs are also recommended.

At the annual election of officers of the Association, the following men were elected: President, Dr. John F. Anderson, director of the hygienic laboratory, Washington, D. C.; first vice president, Dr. George W. Goler, health officer, Rochester; second vice president, Dr. Charles J. Hastings, medical officer of health, Toronto, Ont.; third vice president, Dr. Omar Gillette, Colorado Springs; treasurer, Dr. Lee F. Frankel, Metropolitan Life Insurance Company; secretary, Prof. Selskar M. Gunn, Boston.

Honorary members: Dr. W. S. Gorgas, surgeon general, U. S. Army, Washington, D.C.; Dr. Stephen Smith, state board of charities, New York; Dr. Frederick Montizambert, director general of public health, Dominion of Canada, Ottawa; and Dr. Henry D. Holton, Brattleboro, Vt. Directors for one, two and three years also were elected.

EUROPEAN WAR NOTES.

CONTINUED INCREASE IN COST OF DRUGS.—In previous issues of the JOURNAL we have, from time to time, noted the progressive increase in the cost of various drugs. During the week ended September 9, there was a further increase of three cents per ounce in the cost of quinine and of $1.00 a pound in the price of antipyrin. These and other increases are partly genuine on account of interference with the supply and partly due to speculative action on the part of large holders.

EQUIPMENT OF HOSPITAL BY LAVAL UNIVERSITY.—It is announced that the British War Office has accepted an offer from Laval University of Quebec, to establish, equip and maintain for the remainder of the war a stationary hospital of 520 beds in France or wherever else it may be most needed.

BRITISH-ITALIAN AMBULANCE UNIT.—It is announced that a British ambulance unit has recently started for service in Italy. It will consist of twenty motor ambulances, of which sixteen were given by the Red Cross, and of five other motor cars. It will have a personnel of 55 under command of Mr. George Trevelyan, the historian.

AMERICAN SURGICAL UNITS FOR GERMANY.—It is announced that two American surgical units to consist of twenty surgeons and nurses are to be sent from New York under command of Dr. Herman Fischer, of the German Hospital, to Germany and Austria. This expedition is under the auspices of the American physicians' committee and will act in coöperation with the American Red Cross.

DECLINE OF BRITISH AND GERMAN BIRTH RATES.—Report from Amsterdam by way of London on September 12, states that during the month of July, 1915, there were only 2,520 births in Berlin compared with 3,370 in July, 1914. During the quarter ended July 31, 1914, there were in Berlin 10,030 births while during the corresponding quarter in 1915 there were only 7,523.

Statistics recently issued by the British Registrar General indicate that there has been an even greater decline in the growth of population in England and Wales than in Germany.

"The excess of births over deaths in the June quarter was 27,418 below that for the same period of last year.

The excesses for the four last comparative periods are: 1915, 74,515; 1914, 101,933; 1913, 105,727; 1912, 102,293.

The births in England and Wales in the June

quarter, 213,094, make the lowest recorded since the establishment of civil registration. The figures are 12,973 below the same period last year and correspond to an annual rate of 22.9 per thousand or 3.3 below the 10 years' average for the June quarters.

Deaths, totalling 138,579, were the highest for any June quarter in the decade and were 14,445 in excess of June, 1914.

Marriages, probably owing to the war, were 4,390 in excess of last year, at 55,406."

REPORT OF BELGIAN RELIEF COMMISSION.—The New York Belgian Relief Commission has recently issued a report describing its activities during the past ten months. In this time it has distributed food and other relief supplies to the value of more than $80,000,000. "Up to the first of July, or the end of the first fiscal year of the commission's activities, there were sent to Belgium for the relief of the non-combatant population of the country 305,737 tons of flour, 15,275 tons of rice, 40,680 tons of corn, 15,546 tons of peas and beans, and other supplies, the total weight of which was 423,583 tons.

In addition to the supplies sent to Belgium, the commission has since the first of April last been feeding the destitute people of the German-occupied territory of France. These French sufferers number more than 2,500,000. More than 91,000,000 pounds of supplies have been sent to that part of France. Also about 10,000 tons of food have been donated to relief work in the Grand Duchy of Luxemburg.

The American Red Cross shipped on the Greek liner *Thessalonika* recently for the Red Cross organizations in Turkey and Serbia a consignment of supplies valued at more than $4,000. Forty-four cases were consigned to Ambassador Morgenthau at Constantinople, and the rest to the various Red Cross organizations in Serbia."

WAR RELIEF FUNDS.—On September 17, the totals of the principal New England relief funds for the European war reached the following amounts:

Belgian Fund	$277,560.07
St. George's Fund	11,143.36
French Fund	9,430.18
Italian Fund	3,138.10

DISTRIBUTION OF JEWISH RELIEF.—Report from the American Jewish Relief Committee in New York on September 14, states that the total contributions to the Jewish Fund in the United States now amount to $929,238.38. This sum has been distributed as follows:—

"To Russia, $455,000; to German Poland, $195,000; to Austria-Hungary, $85,000; to Swiss University students, $2,500; to Jews at Salonica, $5,000; to Jews at Aleppo, $2,500; to Jews of Monastir, $3,000; to Jews of Gallipoli and Dardanelles, $2,500; to Rabbi Meir for relief in Uskub and Ischtip, $1,000; to Palestine, $25,000; for stocking Vulcan with foodstuffs, medicines, etc., $84,627.81; administration expenses for offices of treasurer, secretary and propaganda committees, $12,470.47; balance on hand, $55,640.10.

BOSTON AND NEW ENGLAND.

HAYMARKET SQUARE RELIEF STATION.—It is reported that during the first eight months of the current year, 3000 fewer accident cases have been treated at the Haymarket Relief Station in Boston, than during the corresponding period in 1914. This is the first time for nine years that the number of cases has not increased at a steady annual rate of about 5%. The exact cause of this decline is hardly certain. It may be attributable in part to the decline of immigration since the outbreak of the war, and to the operation of the workmen's compensation law.

BOSTON HEALTH COMMISSION.—Dr. Francis X. Mahoney, the new health commissioner of Boston has finally announced the appointment of the deputy commissioners in charge of the various divisions of the department. Dr. Thomas B. Shay is to have charge of the medical division, Dr. Patrick H. Mullowney of the food division, Dr. William H. Davis of the vital statistics division, Mr. Thomas Jordan of the sanitary division and Dr. Francis H. Slack of the bacteriological laboratory.

SCARLET FEVER IN WAKEFIELD, MASS.—The public schools of Wakefield, Mass., have been ordered closed to prevent an epidemic of scarlet fever. Four cases have already developed and as about 500 children have been exposed to the disease, more attacks are feared. The exposure occurred when a boy with scarlet fever attended the Labor Day performance of a local moving picture theatre. The theatre has been fumigated and ordered to remain empty for a week.

THE SPREAD OF PELLAGRA.—The State Department of Health reports in its monthly bulletin for August, 1915, the spread of pellagra in this state. It states that while in 1910 there was but one death from the disease in Massachusetts, during 1914 there were 18. In the year 1913 there were 1013 cases reported. The spread of this disease to all sections of the United States is a matter of grave concern.

NEW HOSPITAL AT MARSHFIELD HILLS, MASS.—It is announced that a small general hospital erected in Marshfield Hills, Mass., for the benefit of the South Shore district between Quincy and Plymouth, will be ready for occupancy in about one month. It will consist of 33 beds, sixteen for surgical cases, eleven for medical and six for obstetrical cases.

HOSPITAL BEQUESTS.—The will of the late Grace Parkman of Dorchester, Mass., which was filed in the Suffolk Registry of Probate on Sep-

tember 8, contained bequests of $3000 each to the Dorchester Home for Consumptives and to the Boston Children's Hospital. A second will, however, which was later found and filed, differs materially from the first and it is as yet uncertain how these legacies will be awarded.

Hospital Requirements at Penikese Island.—The recently published report of the State Board of Charity for the year ending November 30, 1914, records the progress in the care of lepers at the Penikese Hospital, Penikese Island. There were at the close of the year ten patients remaining at the hospital, one patient having died and one being released. As has been previously pointed out in this Journal, the present equipment of the Penikese Hospital is incapable of affording patients proper hospital care or to safeguarding nurses and attendants from undue exposure to contagion while performing their duties. The Board has again requested, therefore, that a modern hospital and dispensary building be erected for the proper care of these patients, and asks an appropriation of $40,000 for this purpose.

Appointment of Director of School Physicians.—At a meeting of the school committee of Boston on September 9, Dr. William H. Devine of South Boston was appointed director of school physicians. This is a new office, created since the resignation of Dr. Harrington as director of school hygiene and made necessary because of the increase in the staff of school physicians. The details of this division of office appeared in a previous issue of the Journal. Dr. Devine will have charge of forty physicians who will be chosen by civil service examination to be held this month, and of 46 nurses who are now in the service.

Reunion of Massachusetts General Hospital Nurses.—The annual meeting and reunion of the alumnae of the Massachusetts General Hospital Training School for Nurses was held at that institution on Monday and Tuesday of last week, September 13 and 14. At the sessions on Tuesday, Dr. William H. Smith read a paper on "New Methods of Medical Treatment," and Dr. Frederick A. Washburn, the administrator, gave an address on the history of the hospital. It is announced that graduate nurses of the Massachusetts General Hospital have given $1000 for the equipment of the Massachusetts Nurses Ward at the Belgian-American Hospital. The alumnae organization consists of 465 members and this reunion is the largest of its kind to be held by the association. Members came from various parts of New England, New York State and Canada.

The desirability of providing the association with an endowment was discussed, and the hope expressed that in eight years, at the time of the fiftieth anniversary of the training school, an endowment fund of $250,000 can be turned over to the trustees of the hospital, thereby providing adequate support for the training school and releasing the funds of the hospital used for that purpose, for other needed work.

Measles in Nantucket.—In the current issue (August, 1915) of the monthly bulletin of the Massachusetts Health Commission is an account of the recent epidemic of measles in the island of Nantucket. Prior to May 7, 1915, only eight cases of measles had ever been reported in Nantucket, four in 1910 and four in 1911. During the present summer, however, 111 cases have occurred. The epidemic is thus described in part by Dr. Adam S. MacKnight, the local health officer:

"It is reasonably safe to assume that the Nantucket epidemic of measles has run its course, and, fortunately, indeed, with but one immediate fatality. Up to the present time the epidemic has not resulted in the development of any secondary foci of this disease among the children of visiting families, which, of course, was to be looked for.

"This epidemic, however, shows the silliness of failure to consult physicians in the early stages of measles, which are more likely to prove infectious than the later stages; the folly of indifferent nursing, lack of care, no prophylaxis; and a tendency toward letting such cases take care of themselves, together with a complete forgetfulness of the golden rule of isolation so far as other people's children are concerned; to say nothing about other members of the same family. The fact that there has been but one death cannot be construed to mean that this epidemic has not been serious; the sequelae tell the story.

"This epidemic has, however, whether intentionally or not, resulted, so far as this generation of children is concerned, in conferring a variable period of immunity, which will serve to protect them until other generations of children come along; then, unless those who have profited by the lesson of this epidemic take heed noting the late example, a repetition at the expense of the usual sufferers—the children themselves—will add another record to the measles history of Nantucket.

"This epidemic also serves to point toward the need of a more efficient school inspection than generally prevails throughout the Commonwealth, *e. g.*, a school inspection that will include school hygiene, personal hygiene and the elementary principles of preventive medicine."

Correspondence.

WAR SURGERY IN FRANCE.

(From Our Special Correspondent.)

Longueil-Annel, Oise, France, Aug. 19, 1915.

Mr. Editor: I have been here at the American Hospital now for ten days. The hospital is situated

near Compiègne. At Compiègne, the battle-front changes its direction from nearly north and south, and runs to the southeast toward Soissons. Annel is even nearer the lines than is Compiègne, and the hospital itself is within three or four miles of the angle.

Because of its proximity to the trenches, the hospital receives its wounded within an hour or two of the time of injury. The first dressing is applied by the soldier himself or by his comrades; he is then taken to a *poste de secour*, which is an army dressing station in one of the small villages near the lines. There a superficial dressing is done, and he is brought by ambulance to the hospital. We draw cases from a section some sixteen miles in length, but the comparatively small number of wounded testify to the thoroughness with which the troops are entrenched. Every day the trenches are under fire; especially at night we can hear the jar of bursting German shells, and the sound of the French shells sent whizzing back in answer.

If there were any serious attempt to gain ground in our section, we should be swamped with wounded; as it is, just enough come in to keep the beds comfortably filled. We have only thirty patients at present, but we have some 20 beds vacant and a new barracks now being built will give 25 more.

Most of the wounds are from shrapnel, shells, or bombs. Occasionally a man comes in who has been drilled by a rifle ball.

The most interesting cases which I have seen so far are worth mentioning. One young chap was struck by a shrapnel ball about the size of a marble. The ball entered at the right costo-vertebral angle, fractured the laminae of the 11th and 12th dorsal vertebrae, struck the left kidney, nicked the spleen, perforated the diaphragm, injured the left lung and lodged just beneath the skin of the left axilla. The surgeon under whom I am working had done a laparotomy before I arrived; later, I helped him do a laminectomy. Today we drew off 500 c.c. of thin, bloody, urinous smelling fluid from the left chest. The boy is doing well, although he is paralyzed below the waist. His cord appeared intact, so we hope for a recovery.

The second man was struck by a rough piece of shell the size of an almond in the second interspace just to the right of the sternum. X-ray showed it in the mediastinum, apparently, at the level of the third rib. At operation, the mediastinum was opened from in front, but search as thorough as seemed wise, considering the structure of that region, failed to show it. The man died two days later. Autopsy showed the fragment in the pericardium, resting upon the aorta, surrounded by a small abscess. There was general fibrinous pericarditis, and the right pleura was full of bloody fluid.

It seems that it is very easy to keep these wounds clean if they are thoroughly dressed within the first 24 hours. The sinus formed by the projectile, however, becomes lined with a black, dry slough which takes a long time to clear up. The chief disinfectants which are used in wounds are hydrogen peroxide, tincture of iodine, and a solution advocated by Carrel, who by the way is at Compiègne, composed of sodium hyposulphite with boric acid added. Hypochlorous acid is set free, according to the London *Lancet* of August 14th. This is a powerful antiseptic, but seems to have a deterring influence upon granulation.

The patients themselves are, as a rule, splendid, simple-hearted fellows, and it is a pleasure to look after them. Notwithstanding the very real horror and uselessness of the war, the tragedy of promising young men maimed or killed, one finds much that is admirable—much patriotism, great courage—woven into its complex web.

Yours very truly,

G. G. S.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION FOR THE WEEK ENDING SEPT. 11, 1915.

No contributions for the week ending Sept. 11, 1915.

Previously reported receipts	$7814.84
Previously reported disbursements	7310.04
Balance	$ 504.80

F. F. SIMPSON, M.D., *Treasurer*,
7048 Jenkins Arcade Bldg.,
Pittsburg, Pa.

EXAMINATION FOR BOSTON SCHOOL PHYSICIANS.

A competitive examination of applicants for the position of School Physician under the Boston School Committee will be held on September 23, 1915. The salary will probably be $500 per annum. This examination will be held for the purpose of establishing an eligible list from which names will be certified to fill from thirty-five to forty vacancies existing at present and similar vacancies as they may occur.

Only registered physicians who are citizens of the United States and who have been residents of Massachusetts for the past year and of Boston for the six months last past have a right to apply.

The subjects of the examination will include a sworn statement of training and experience, practice of medicine, and hygiene.

Successful applicants may also be required to undergo a physical examination. Men and women desiring to take this examination may secure application blanks by applying, in person or by letter, at the office of the Civil Service Commission, Room 152, State House, Boston.

By order of the

MASSACHUSETTS CIVIL SERVICE COMMISSION,
WARREN P. DUDLEY, *Secretary*.

RECENT DEATHS.

DR. CHARLES P. BECKER, who died recently of nephritis in New York, was born in that city in 1844. He received the degree of M.D. in 1861 from the Long Island Medical College and practised his profession until his retirement in 1900. He was for many years an associate editor of the *New York Medical Journal*. He is survived by two sons.

APPOINTMENT.

Dr. H. G. Earle has been appointed professor of physiology at the University of Hong Kong.

NEW YORK AND NEW ENGLAND ASSOCIATION RAILWAY SURGEONS.—The twenty-fifth annual session of the New York and New England Association Railway Surgeons, celebrating the quarter century anniversary of the organization of the association, will be held at Hotel Astor, New York City, October 21, 1915, under the presidency of Dr. W. H. Marcy, of Buffalo, N. Y.

A very interesting and attractive program has been arranged. Railway surgeons, attorneys and officials, and all members of the medical profession are cordially invited to attend.

GEORGE CHAFFEE, M.D., *Corresponding Secretary*.
338 47th Street, Brooklyn, N. Y.